FACILITY NAME GEORGIA PACIFIC CONSUMER PRODUCTS (CAMAS), LLC.

February 15, 2008

PURPOSE OF THIS FACT SHEET

This fact sheet explains and documents the decisions Ecology made in drafting the proposed National Pollutant Discharge Elimination System (NPDES) permit for Georgia Pacific Consumer Products (Camas) L.L.C., Camas, Washington.

The Environmental Protection Agency (EPA) developed the NPDES permitting program as a tool to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." EPA delegated to Ecology the power and duty to write, issue, and enforce NPDES permits within Washington State. Both state and federal laws require any industrial facility to obtain a permit before discharging waste or chemicals to a water body.

An NPDES permit limits the types and amounts of pollution the Permittee may discharge. Those limits are based either on (1) the pollution control or wastewater treatment technology available to the industry, or on (2) the receiving water's customary beneficial uses. This fact sheet complies with Section 173-220-060 of the Washington Administrative Code (WAC), which requires Ecology to prepare a draft permit *and accompanying fact sheet* for public evaluation before issuing an NPDES permit.

PUBLIC ROLE IN THE PERMIT

Ecology makes the draft permit and fact sheet available for public review and comment at least thirty (30) days before we issue the final permit to the facility operator (WAC 173-220-050). Copies of the fact sheet and draft permit for Georgia Pacific, NPDES permit WA-000025-6**,** are available for public review and comment from August 12, 2008 until the close of business September 12, 2008. For more details on preparing and filing comments about these documents, please see **Appendix A, Public Involvement**.

Before publishing the draft NPDES permit, Georgia Pacific Camas, reviewed it for factual accuracy. Ecology corrected any errors or omissions about the facility's location, product type or production rate, discharges or receiving water, or its history.

After the public comment period closes, Ecology will summarize substantive comments and our responses to them. Ecology will include our summary and responses to comments to this Fact Sheet as **Appendix D, Response to Comments**, and publish it when we issue the final NPDES permit. The rest of the fact sheet will not be revised, but the full document will become part of the legal history contained in the facility's permit file.

SUMMARY

Georgia Pacific Consumer Products (Camas) L.L.C. is located in Camas, Washington. The facility discharges their treated wastewater into the Columbia River. Ecology proposes to reissue a permit to Georgia Pacific Consumer Products (Camas) L.L.C. The permit prescribes operating conditions, wastewater discharge limits, and testing requirements. This fact sheet describes the facility and Ecology's reasons for requiring permit conditions.

WASHINGTON STATE DEPARTMENT OF ECOLOGY
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
WASTEWATER DISCHARGE PERMIT
GEORGIA PACIFIC CONSUMER PRODUCTS (CAMAS), LLC
CAMAS, WASHINGTON

FACT SHEET
PERMIT No. WA 000025-6

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TABLE OF CONTENTS

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I. INTRODUCTION

The Federal Clean Water Act (FCWA, 1972, and later amendments in 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One mechanism for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System of permits (NPDES permits), administered by the federal Environmental Protection Agency (EPA). The EPA authorized the State of Washington to manage the NPDES permit program in our state. Our state legislature accepted the delegation and assigned the power and duty for conducting NPDES permitting and enforcement to Ecology. The legislature defined Ecology's authority and obligations for the wastewater discharge permit program in 90.48 RCW (Revised Code of Washington). Ecology adopted rules describing how it exercises its authority:

- Procedures Ecology follows for issuing NPDES permits (chapter 173-220 WAC),
- Water quality criteria for surface waters (chapter 173-201A WAC) and for ground waters (chapter 173-200 WAC)
- Sediment management standards (chapter 173-204 WAC).

These rules require any industrial facility operator to obtain an NPDES permit before discharging wastewater to state waters. They also define the basis for limits on each discharge and for other performance requirements imposed by the permit.

Under the NPDES permit program Ecology must prepare a draft permit and accompanying fact sheet, and make it available for public review. Ecology must also publish an announcement (public notice) telling people where they can read the draft permit, and where to send their comments on the draft permit, during a period of thirty days (WAC 173-220-050). (See **Appendix A--Public Involvement** for more detail about the Public Notice and Comment procedures). After the Public Comment Period ends, Ecology may make changes to the draft NPDES permit in response to comments. Ecology will summarize the responses to comments and any changes to the permit in **Appendix D.**

GENERAL INFORMATION	
Applicant	Georgia Pacific Consumer Products (Camas) LLC
Facility Address	401 N. E. Adams Street, Camas, Washington 98607
Type of Facility	Bleached Pulp and Paper
SIC Code	2611 & 2621
Discharge Location	Columbia River, River Mile 120 Outfall 001 Latitude: 45° 34' 15" N Longitude: 122° 24' 45" W. Outfall 002 Latitude: 45° 35' 00" N Longitude: 122° 24' 30" W.
Water Body ID Number	Segment No. 26 WRIA 99 WA-CR-1010 1240014462974

II. BACKGROUND INFORMATION

A. FACILITY DESCRIPTION

Location

The Camas Mill is a pulp and paper manufacturing complex that is bound on three sides by the City of Camas, Washington. A little over a quarter of the mill site lies north of the Camas Slough (an arm of the Columbia River that connects to the Washougal River). The rest of the mill resides on Lady Island which is situated directly south of the slough and fronts the Columbia River. The wastewater treatment system and a solid waste landfill are located on this island.

Industrial Process

The mill produces bleached Kraft paper, tissue, and toweling products. The nominal production rates for this pulp and paper facility are listed as follows.

Production Rate Table (Machine Air Dry Tons/ Day)

Bleached Kraft Paper Grade	1,046
Non-integrated Tissue	19
Secondary Fiber Non-Deink	12
Total Production	1,077

Receiving Water

Columbia River

River Mile 120
Latitude: 45° 34' 15" Longitude: 122° 24' 45"
Water Body ID. 1240014462974

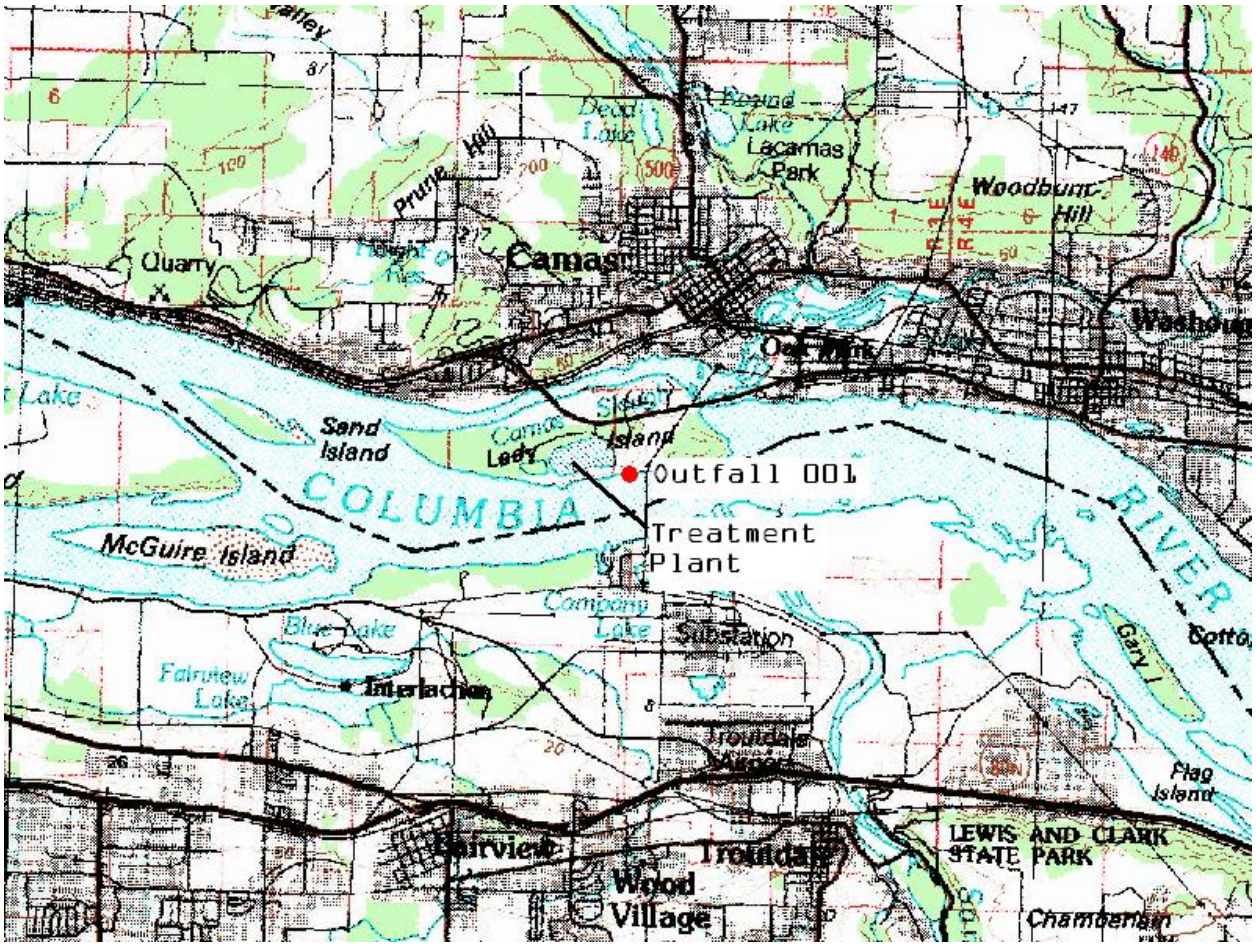
A description of the use classification of the Columbia River nearby the discharge is on Page 27 of this fact sheet.

Discharge Outfalls

Outfall 001

Outfall 001 is the principal outfall. Georgia Pacific treats mill wastewater and an intermittent discharge of groundwater from the sand traps on the mill well water system with primary treatment in a 330-foot diameter clarifier followed by secondary treatment. The secondary treatment system consists of a 250 million gallon (66 acres), moderately mixed plug flow aerated stabilization basin followed by a 150 million gallon (42 acres) partially mixed aerated basin with a settling zone. The final effluent discharges through Outfall 001 which extends 384 feet into the Columbia River. Due to strong subsurface turbulence in this area of the river, the mill provided

the outfall with a strategically positioned single port. This design provides better dilution than the diffuser approach previously employed. The minimum water depth over the outfall is 50 feet.



Outfall 002

The discharge that comprises Outfall 002 travels under the Camas Mill in a concrete channel or pipe and originates in Blue Creek and Whiskey Creek on the southeastern slope of Prune Hill. It contains Lacamas Lake water, mill water treatment filter backwash, and stormwater from the City of Camas. The outfall discharges directly to the north shore of the Camas Slough.
In the mid 1980, Ecology issued permits that required treatment of filter plant backwash to remove solids. Several companies appealed the condition. In 1986, the Pollution Control Hearing Board (PCHB) ruled against Ecology and the condition was taken out of the permits. Since it has been twenty years since the PCHB ruling, Ecology is requiring the Permittee to perform an All, Known, Available, and Reasonable Treatment (AKART) analysis on the filter backwash. The study shall determine if there are reasonable treatment technologies for this source of pollution presently available. The Permittee will be required to submit the study to Ecology within four years of the effective date of the permit. If a BPJ analysis of discharge data determines that a cost effective alternative exists, a discharge limit may be set.

The mill monitors this outfall continuously for the following parameters: flow and pH. The mill

uses a Palmer-Bowlus flume to measure flow in an underground pipeline and is located west of the K5 Bleach Plant. The pH monitoring station is near the Will Sheet 1 Building.

Outfall 003 (Historical)

Outfall 003 was a sand trap purge from the well field located in the southeast corner of the mill. The outfall discharged directly to the north shore of the Washougal River. In December 2002, Georgia Pacific notified Ecology of its intention to eliminate Outfall 003, which it is accomplished by routing the flow to Outfall 001. The mill designed its wastewater treatment systems to treat up to 76 million gallons per day (MGD) of raw wastewater with its primary and secondary treatment system. The maximum flow from Outfall 003 was at 0.076 MGD and current Outfall 001 flow is 20 to 35 MGD. Therefore, the diversion of Outfall 003 to 001 did not present a significant burden on the wastewater treatment system. Ecology analyzed the reasonable potential of the combined discharge and determined that the combined Outfall 001 had no potential to exceed the water quality standards, WAC 173-201A.

Storm Water Outfall

The Permittee collects, treats, and discharges stormwater as part of the process discharge and has met all of required planning and monitoring requirements. Specialty Minerals collects stormwater on its property and discharges it to the mill treatment system. Stormwater discharge limitations are consistent with and incorporated in the process effluent discharge limitations.

B. PERMIT STATUS

Ecology initially issued the previous permit for this facility on April 3, 2003. The effluent limits presently in effect are:

Outfall 001

	Effluent Limitations		Monitoring Requirements	
Parameter	Monthly Average	Daily Maximum	Frequency	Sample
Biochemical Oxygen Demand (5-day), lbs/day	14,633	28031	Daily	24-Hour Composite
Total Suspended Solids, lbs/day	29,927	56,019	Daily	24-Hour Composite
AOX, lbs/day	1,401	2,138	Weekly	24-Hour Composite
Dioxin (2,3,7,8-TCDD)	–	10 ppq	Quarterly	24-Hour Composite
pH	5.0 to 8.5		Continuous	Recording
Flow, MGD	–	–	Continuous	Recording
Temperature, ^{o}F	–	–	Continuous	Recording
Production, Off-Machine tons/day			Daily	

Outfall 002

Parameter	Effluent Limitations Monthly Average	Daily Maximum	Monitoring Requirements Frequency	Sample
pH	--------6.0 to 9.5----------		Continuous	Recording
Flow, MGD	–	–	Continuous	Recording

Georgia Pacific submitted an application for permit renewal to Ecology on August 28, 2007, and Ecology accepted it on October 10, 2007.

C. SUMMARY OF COMPLIANCE WITH PREVIOUS PERMIT

Ecology conducted the last compliance inspection on August 30, 2007. Ecology found the facility in compliance with its permit limits.

During the last five years (2002-2007), the facility has remained in compliance based on Discharge Monitoring Reports (DMRs) submitted to Ecology and inspections conducted by Ecology.

D. WASTEWATER CHARACTERIZATION

Georgia Pacific's effluent analysis results submitted with the renewal application indicated the presence of the pollutants listed below at concentrations above detection limits. Of the pollutants listed, arsenic, cadmium, chromium, copper, lead, nickel, and zinc are considered potentially toxic substances and are assigned water quality standards under WAC 173-201A-040. The fact sheet addressed these particular substances under the toxic pollutant subcategory.

The proposed wastewater discharge is characterized for the following regulated parameters:

Outfall 001 – Principal Discharge to Columbia River

See page 8 for detailed description of Outfall 001.

Table 1:

Parameter*	**Outfall 001**	**Outfall 002**	**Units**
BOD_5	Max. 80 Avg. 23	Less than 4	mg/L
TSS	Max. 197 Avg. 32	3.7	mg/L
Total Phenol	0.05	–	
Aluminum	0.34	0.11	mg/L
Bromide	0.20	–	mg/L
Barium	0.07	0.012	mg/L

Boron	0.04	0.007	mg/L
δ-BHC	0.000025	–	
Endrin	0.000023	–	mg/L
Cobalt	0.0005	0.00033	mg/L
Iron	0.45	0.522	mg/L
Magnesium	5.88	3.18	mg/L
Mercury	0.000051	0.000001	mg/L
Molybdenum	0.003	0.120	mg/L
Nickel	0.007	0.0027	mg/L
Manganese	0.27	0.055	mg/L
Titanium	0.012	0.017	mg/L
Antimony	0.0003	0.00007	mg/L
Nitrate-Nitrite (as N)	–	0.49	mg/L
Total Organic Nitrogen	5.80	0.05	mg/L
Zinc	0.020	0.0032	mg/L
Phosphorous	0.94	0.05	mg/L
Sulphate	428	2.5	mg/L
Arsenic	0.002	–	mg/L
Cadmium	0.0003	0.00003	mg/L
Chromium	0.005	0.00024	mg/L
Copper	0.005	0.0017	mg/L
Lead	0.00004	0.0004	mg/L

Table 2: Yr 2003-2008

Parameter	**Average**	**High/Low Range**	**Concentration***
Flow – MGD	32.25	38.5/20.8	--
pH	--	8.4/6.9	--
BOD - lbs/day	6,600	14,600/1,600	59/5
TSS - lbs/day	9,700	16,200/3,200	18/64

* Milligrams per liter [mg/L]

Outfall 002 – Secondary Discharge to Camas Slough

See page 9 for detailed description of Outfall 002.

Parameter	Biennial Average	High/Low Range	Concentration*
Flow – MGD	7.6	15.5/2.7	--
pH	--	6.8/8.9	--

* Milligrams per liter [mg/L]

III. PROPOSED PERMIT LIMITATIONS

Federal and State regulations require that effluent limits in an NPDES permit must be either technology- or water quality-based.

- Technology-based limits are based upon the treatment methods available to treat specific pollutants. Technology-based limits are set by the EPA and published as a regulation, or Ecology develops the limit on a case-by-case basis (40 CFR 125.3, and chapter 173-220 WAC).

- Water quality-based limits are calculated so that the effluent will comply with the Surface Water Quality Standards (chapter 173-201A WAC), Ground Water Standards (chapter 173-200 WAC), Sediment Quality Standards (chapter 173-204 WAC) or the National Toxics Rule (40 CFR 131.36).

- Ecology must apply the most stringent of these limits to each parameter of concern. These limits are described below.

The limits in this permit reflect information received in the application. Ecology evaluated the permit application and determined the limits needed to comply with the rules adopted by the State of Washington. Ecology does not develop effluent limits for all reported pollutants**.** Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation.

Nor does Ecology usually develop permit limits for pollutants that were not reported in the permit application but that may be present in the discharge. The permit does not authorize discharge of the non-reported pollutants. During the five-year permit term, the facility's effluent discharge conditions may change from those conditions reported in the permit application. The facility must notify Ecology, as described in 40 CFR 122.42(a), if significant changes occur in any constituent. Industries may be in violation of their permit until the permit is modified to reflect additional discharge of pollutants.

A. DESIGN CRITERIA

The design criteria for the treatment facility are sufficient to provide secondary treatment to all wastewater. Georgia Pacific may dredge the wastewater treatment aeration basin with Ecology's approval when it needs dredging.

In accordance with WAC 173-220-150 (1)(g), flows or waste loadings must not exceed approved design criteria. The design criteria for this treatment facility are taken from the permit applications submitted to Ecology. The original design parameters are as follows:

Table 2: Design Standards for Peak Monthly Waste Load with Adequate Safety Factors

Georgia Pacific Consumer Products (Camas) L.L.C.

Parameter	Design Capability
Flow - Monthly Average (Maximum Month)	76.0 MGD
BOD_5 - Influent Loading	174,000 lbs/day
TSS - Influent Loading	143,000 lbs/day
Temperature	110ºF

Ecology decided not to establish design criteria for Georgia Pacific Camas Mill's wastewater treatment facility through a formal engineering review process. The facility has demonstrated the ability to comply with their limits, at full production, for many years. Because the facility is currently at significantly *less than* half of its full treatment capability we have not included a requirement for an engineering analysis in this permit. When the facility approaches full production in the future, Ecology will require the facility to prepare an engineering report evaluating the capacity of both the process wastewater facility in order to formally establish Ecology approved design criteria.

B. TECHNOLOGY BASED EFFLUENT LIMITS

Ecology sets technology-based limits by regulation or on a case by case basis. EPA periodically evaluates specific industries, such as pulp and paper, and publishes federal effluent guidelines which represent technology-based effluent limitations. Washington state law imposes a requirement to provide all known available and reasonable methods of treatment (AKART), and this requirement is functionally an overlay on the federal requirements. AKART may dictate more stringent technology-based limits than the federal effluent guidelines.

The federal effluent guidelines establish best practicable control technology (BPT) and best conventional pollutant control technology (BCT) for the bleached Kraft Paper Grade, Wastepaper Tissue, and Non-Integrated Tissue category in 40 CFR Part 430 Subpart B, J and L. On December 17, 1993, EPA proposed revised federal effluent guidelines for the pulp and paper industry that it referred to as the "Cluster Rule." Following extensive review and public comments, EPA adopted and published the Cluster Rule (40 CFR Part 430) on April 15, 1998.

As a general rule, if the effluent guidelines for a particular pollutant/source category are five years old or newer, Ecology presumes they will be AKART. If the effluent guidelines are over 10 years old, Ecology reviews the federal effluent guidelines development document and analyzes unit processes design and efficiencies to determine that the effluent guidelines constitute AKART and meet the intent of RCW 90.48.520. The federal effluent guidelines development document describes production processes, pollutants generated, treatment efficiencies, and unit process designs present nationwide in the specific industry at the time of effluent guideline development.

Since the Cluster Rule is now 9 years old, Ecology reviewed the treatability data base, and information concerning the demonstrated removal efficiencies for Georgia Pacific's primary and secondary treatment system in order to establish that the federal effluent guidelines constitute AKART. Ecology concluded that any further treatment beyond secondary treatment would only add a few percentage points to the removal efficiencies for BOD_5 and TSS. Based on this review, Ecology determined that Georgia Pacific's secondary treatment with an aerated stabilization basin (ASB) is equivalent to AKART for conventional pollutants in this wastewater stream, and the technology-based limits in the federal Effluent Limitations Guidelines are the appropriate limits.

The NPDES permit renewal application submitted to Ecology and received in September 2007 for this source defined the baseline production as 1046 off-machine tons per day (OMT/D) of bleached Kraft paper (BCT), 19 OMT/D of non-integrated tissue paper (NSPS), and 12 OMT/D of secondary Fiber Non-Deink paper (BCT) for a total of 1077. Each of these categories provides technology-based limits in terms of pounds per day of biochemical oxygen demand (BOD_5) and total suspended solids (TSS). The technology-based limits vary for several different products produced under the Bleached Kraft Subcategory. For this subcategory, EPA defined BCT to be the same as BPT. The limits for NSPS are more stringent than for BPT. The regulatory basis for pollutant limits is as follows:

Production Category	Production, Ton/Day	Applicable Regulation
Bleached Kraft Paper (BCT)	1,046	40 CFR 430.23, Subpart B
Non-integrated Tissue (NSPS)	19	40 CFR 430.125, Subpart L
Secondary Fiber, Non-Deink (BCT)	12	40 CFR 430.105, Subpart J
Total	1,077	

CONVENTIONAL POLLUTANTS

Table 3. Production Derived Limits

BOD						
Production Unit	ADT/Day (Off-Machine)	Basis for Limit	Monthly Average (lbs/ton)	Monthly Average (lbs/day)	Daily Maximum (lbs/ton)	Daily Maximum (lbs/day)
Bleached Kraft Paper Grade	1,046	BCT	11.0	11,506.0	21.2	22,175.2
Non-integrated Tissue	19	NSPS	6.8	129.2	14.0	266.0
Secondary Fiber, Non-Deink	12	BCT	14.2	170.4	27.4	328.8
Totals	1,077			11,805.6		22,770.0

TSS

Production Unit	ADT/Day (Off-Machine)	Basis for Limit	Monthly Average (lbs/ton	Monthly Average (lbs/day)	Daily Maximum (lbs/ton)	Daily Maximum (lbs/day)
Bleached Kraft Paper Grade	1,046	BCT	23.8	24,894.8	44.3	46337.8
Non-integrated Tissue	19	NSPS	5.2	98.8	12.0	228.0
Secondary Fiber, Non-Deink	40	BCT	18.4	220.8	34.1	409.2
Totals	1,077			25,214.4		46,975.0

NON-CONVENTIONAL POLLUTANTS

EPA established effluent limits for non-conventional pollutants, effective after April 15, 2001, that represent the degree of effluent reduction attained by mills applying best available technology (BAT) economically achievable from Bleached Paper Grade Kraft and Soda, Subcategory 40 CFR, Part 430.24. EPA based effluent limits for adsorbable organic halides (AOX) and chloroform on the quantity of unbleached pulp entering the bleach plant. This production basis differs from that for conventional pollutants, which EPA based on gross paper machine production at the off-machine reel. The paper machine production analysis takes into account processed recycled pulp, paper machine additives, pulp mill losses, bleach plant losses, and machine paper moisture, while unbleached screened pulp production has no other constituents or process adjustments affecting its final production determination. The facility measures AOX at the outfall and chloroform at the bleach plant. Table 4 defines the production and limits for AOX and chloroform in the mill's effluent.

Table 4. Production Derived Limits For Bleach Plant Discharges

AOX					
Production Unit	ADT/Day (to Bleach Plant)	Monthly Average Factor (lbs/ton)	Daily Maximum Factor (lbs/ton)	Monthly Average (lbs/day)	Daily Maximum (lbs/day)
Unbleached Pulp (Average Month)	916.0	1.246	1.902	1141.3	1742.2

CHLOROFORM					
Production Unit	ADT/Day (to Bleach Plant)	Monthly Average Factor lbs/ton)	Daily Maximum Factor lbs/ton	Monthly Average (lbs/day)	Daily Maximum (lbs/day)
Unbleached Pulp (Average Month)	916.0	0.00828	0.01384	7.58	12.68

BLEACH PLANT EFFLUENT LIMITS

Bleach plant effluent limits for the following organic chemicals are established by 40 CFR 430.24 at minimum levels:

Pollutant	Minimum Level
2,3,7,8-TCDD	10 pg/L[(1)]
2,3,7,8-TCDF	31.9 pg/L[(1)]
Trichlorosyringol	2.5 µg/L[(2)]
3,4,5-Trichlorocatechol	5.0 µg/L[(2)]
3,4,6-Trichlorocatechol	5.0 µg/L[(2)]
3,4,5-Trichloroguaiacol	2.5 µg/L[(2)]
3,4,6-Trichloroguaiacol	2.5 µg/L[(2)]
4,5,6-Trichloroguaiacol	2.5 µg/L[(2)]
2,4,5-Trichlorophenol	2.5 µg/L[(2)]
2,4,6-Trichlorophenol	2.5 µg/L[(2)]
Tetrachlorocatechol	5.0 µg/L[(2)]
Tetrachloroguaiacol	5.0 µg/L[(2)]
2,3,4,6-Tetrachlorophenol	2.5 µg/L[(2)]
Pentachlorophenol	5.0 µg/L[(2)]

Notes:

(1) Picograms per liter.
(2) Micrograms per liter.

EPA defines minimum level as "the level at which the analytical system give recognizable signals and acceptable calibration points."

BEST MANAGEMENT PRACTICES

Federal regulations (40 CFR 430.28) require Best Management Practices (BMPs) to prevent leaks and spills of spent pulping liquors, soap, and turpentine. Georgia Pacific established a program to accomplish this objective and is currently implementing the program. Permit Condition S9 requires the mill to implement its established BMP program. The plan is to focus on prevention measures as a first priority to insure to the extent possible that leaks or spills do not occur. In the event that a significant leak or spill does occur, the plan will provide, where necessary, for containment and diversions of the regulated substance to protect the integrity of the wastewater treatment system.

C. SURFACE WATER QUALITY-BASED EFFLUENT LIMITS

The Washington State Surface Water Quality Standards (chapter 173-201A WAC) were designed to protect existing water quality and preserve the beneficial uses of Washington's surface waters. Waste discharge permits must include conditions that ensure the discharge will meet established surface water quality standards (WAC 173-201A-510). Water quality-based effluent limits may be based on an individual waste load allocation or on a waste load allocation developed during a basin wide total maximum daily loading study (TMDL).

NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE

Numerical water quality criteria are published in the Water Quality Standards for Surface Waters (chapter 173-201A WAC). They specify the levels of pollutants allowed in receiving water to protect aquatic life and recreation in and on the water. Ecology uses numerical criteria along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limits, the discharge must meet the water quality-based limits.

NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH

The U.S. EPA has published 91 numeric water quality criteria for the protection of human health that are applicable to dischargers in Washington State (40 CFR 131.36). These criteria are designed to protect humans from exposure to pollutants linked to cancer and other diseases, based on consuming fish and shellfish and drinking contaminated surface waters. The Water Quality Standards also include radionuclide criteria to protect humans from the effects of radioactive substances.

NARRATIVE CRITERIA

Narrative water quality criteria (e.g., WAC 173-201A-240(1); 2006) limit the toxic, radioactive, or other deleterious material concentrations that the facility may discharge to levels below those which have the potential to:

- Adversely affect designated water uses.
- Cause acute or chronic toxicity to biota.
- Impair aesthetic values.
- Adversely affect human health.

Narrative criteria protect the specific designated uses of all fresh waters (WAC 173-201A-200; 2006) and of all marine waters (WAC 173-201A-210,; 2006) in the State of Washington.

ANTI-DEGRADATION

The purpose of Washington's Antidegradation Policy (WAC 173-201A-300-330; 2006) is to:

- Restore and maintain the highest possible quality of the surface waters of Washington.
- Describe situations under which water quality may be lowered from its current condition.
- Apply to human activities that are likely to have an impact on the water quality of surface water.
- Ensure that all human activities likely to contribute to a lowering of water quality, at a minimum, apply all known, available, and reasonable methods of prevention, control, and treatment (AKART).
- Apply three Tiers of protection (described below) for surface waters of the state.

Tier I ensures existing and designated uses are maintained and protected and applies to all waters and all sources of pollutions. Tier II ensures that waters of a higher quality than the criteria assigned are not degraded unless such lowering of water quality is necessary and in the overriding public interest. Tier II applies only to a specific list of polluting activities. Tier III prevents the degradation of waters formally listed as "outstanding resource waters," and applies to all sources of pollution.

A facility must prepare a Tier II analysis when all three of the following conditions are met:

- The facility is planning a new or expanded action.
- Ecology regulates or authorizes the action.
- The action has the potential to cause measurable degradation to existing water quality at the edge of a chronic mixing zone.

This facility must meet Tier I requirements.

- Existing and designated uses must be maintained and protected. No degradation may be allowed that would interfere with, or become injurious to, existing or designated uses, except as provided for in this chapter.

MIXING ZONES

A mixing zone is the defined area in the receiving water surrounding the discharge port(s), where wastewater mixes with receiving water. Within mixing zones the pollutant concentrations may exceed water quality numeric criteria, so long as the diluting wastewater doesn't interfere with designated uses of the receiving water body (e.g., recreation, water supply, and aquatic life and wildlife habitat, etc.) The pollutant concentrations outside of the mixing zones must meet water quality numeric criteria.

State and federal rules allow mixing zones because the concentrations and effects of most pollutants diminish rapidly after discharge, due to dilution. Ecology defines mixing zone sizes to limit the amount of time any exposure to the end-of-pipe discharge could harm water quality, plants, or fish.

The state's water quality standards allow Ecology to authorize mixing zones for the facility's permitted wastewater discharges only if those discharges already receive all known, available,

and reasonable methods of prevention, control and treatment (AKART). Mixing zones typically require compliance with water quality criteria within 200 to 300 feet from the point of discharge; and use no more than 25% of the available width of the water body for dilution. We use modeling to estimate the amount of mixing within the mixing zone. Through modeling we determine the potential for violating the water quality standards at the edge of the mixing zone and derive any necessary effluent limits. Steady-state models are the most frequently used tools for conducting mixing zone analyses. Ecology chooses values for each effluent and for receiving water variables that correspond to the time period when the most critical condition is likely to occur (see Ecology's Permit Writer's Manual). Each critical condition parameter (by itself) has a low probability of occurrence and the resulting dilution factor is conservative. The term "reasonable worst-case" applies to these values.

The mixing zone analysis produces a numerical value called a dilution factor (DF). A dilution factor represents the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. For example, a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water comprises 90% of the total volume at the boundary of the mixing zone. We use dilution factors with the water quality criteria to calculate reasonable potentials and effluent limits. Water quality standards include both aquatic life-based criteria and human health-based criteria. The former are applied at both the acute and chronic mixing zone boundaries; the latter are applied only at the chronic boundary. The concentration of pollutants at the boundaries of any of these mixing zones may not exceed the numerical criteria for that zone.

Each aquatic life **acute** criterion is based on the assumption that organisms are not exposed to that concentration for more than one-hour and more often than one exposure in three years. Each aquatic life **chronic** criterion is based on the assumption that organisms are not exposed to that concentration for more than four consecutive days and more often than once in three years.

The two types of human health-based water quality criteria distinguish between those pollutants linked to non-cancer effects (non-carcinogenic) and those linked to cancer effects (carcinogenic). The human health-based water quality criteria incorporate several exposure and risk assumptions. These assumptions include:

- A 70-year lifetime of daily exposures.
- An ingestion rate for fish or shellfish measured in kg/day.
- An ingestion rate of two liters/day for drinking water
- A one-in-one-million cancer risk for carcinogenic chemicals.

This permit authorizes a small acute mixing zone, surrounded by a chronic mixing zone around the point of discharge (WAC 173-201A-400; 2006). The water quality standards impose certain conditions before allowing the discharger a mixing zone:

1. Ecology must specify both the allowed size and location in a permit.

The proposed permit specifies the size and location of the allowed mixing zone.

2. The facility must fully apply "all known available and reasonable methods of prevention, control and treatment" (AKART) to its discharge.

Ecology has determined that the treatment provided and the pollution prevention activities practiced at Georgia Pacific at Camas meets the requirements of AKART (see "Technology based Limits").

3. Ecology must consider critical discharge conditions.

Surface water quality-based limits are derived for the water body's critical condition, (the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or designated water body uses). The critical discharge condition is often pollutant-specific or water body-specific.

Critical discharge conditions are those conditions that result in reduced dilution or increased effect of the pollutant. Factors affecting dilution include the depth of water, the density stratification in the water column, the currents and the rate of discharge. Density stratification is determined by the salinity and temperature of the receiving water. Temperatures are warmer in the surface waters in summer. Therefore, density stratification is generally greatest during the summer months. Density stratification affects how far up in the water column a freshwater plume may rise. The rate of mixing is greatest when an effluent is rising. The effluent stops rising when the mixed effluent is the same density as the surrounding water. After the effluent stops rising, the rate of mixing is much more gradual. Water depth can affect dilution when a plume might rise to the surface when there is little or no stratification. Ecology's Permit Writer's Manual describes additional guidance on criteria/design conditions for determining dilution factors. The Manual can be obtained from Ecology's website at: http://www.ecy.wa.gov/biblio/92109.html.

Ecology used the following critical conditions to model the discharge. Ecology obtained the data from Georgia Pacific at Camas – Mixing Zone Temperature Evaluation and Dilution Ratio Study, Parametrix, November 2004 and other sources, including data monitoring reports submitted by the facility:

- The seven day average low river flow with a recurrence interval of ten years (7Q10) 80,900 cfs.
- River depth of 49.6 feet at the 7Q10 period.
- River velocity of 0.5 ft per second.
- Number of ports: 1.
- Port Diameter: 60-inch diameter ports.
- Vertical Discharge Angle: 45 degrees.
- Horizontal Discharge Angle: 0 degrees
- Port Depth: 54.4 feet
- Port Elevation: 7.5 feet
- Maximum average monthly effluent flow of 31 MGD for chronic and human health non-carcinogen.
- Annual average flow of 27 MGD for human health carcinogen.
- Maximum daily flow of 36.1 million gallons per day (MGD) for acute mixing zone (November 2006).

- Ambient air temperature: Average summer @ 19°C; Maximum @ 35°C. Ambient air temperature has strong effect to the receiving water temperature as one may expect, especially during the hot summer days. There is a link between the highest 7-DADMax temperature listed this section, 23.15ºC, which corresponds to 33.33ºC during the same period (Parametrix 2006).
- Highest ambient receiving water 7-DADMAX = 23.15°C (June 2002 – July 2006).
- The ambient receiving water 1-DMax at 90 percentile is 21.80°C.
- The ambient receiving water 7-DADMax at 90 percentile is 21.50ºC.
- Highest annual effluent temperatures observed from June 2002 to July 2006 are 30.85°C at 95 percentile and 30.97°C at 99 percentile, respectively.

4. Supporting information must clearly indicate the mixing zone would not:

- Have a reasonable potential to cause the loss of sensitive or important habitat,
- Substantially interfere with the existing or characteristic uses,
- Result in damage to the ecosystem, or
- Adversely affect public health.

Ecology established Washington State water quality criteria for toxic chemicals using EPA criteria. EPA developed the criteria using toxicity tests with numerous organisms, and set the criteria to protect all aquatic species.

EPA sets acute criteria for toxic chemicals assuming organisms are exposed to the pollutant at the criteria concentration for 1-hour. They set chronic criteria assuming organisms are exposed to the pollutant at the criteria concentration for 4 days. Dilution modeling under critical conditions generally shows that both acute and chronic criteria concentrations are reached within minutes of being discharged.

The discharge plume does not impact drifting and non-strong swimming organisms because they cannot stay in the plume close to the outfall long enough to be affected. Strong swimming fish could maintain a position within the plume, but they can also avoid the discharge by swimming away. Mixing zones generally do not affect benthic organisms (bottom dwellers) because the buoyant plume rises in the water column. Ecology has additionally determined that this effluent will not exceed 33 degrees C for more than 2 seconds after discharge; and that the temperature of the water will not create lethal conditions or blockages to fish migration.

Ecology evaluates the cumulative toxicity of an effluent by testing the discharge with whole effluent toxicity (WET) testing.

Ecology reviewed the above information, the specific information on the characteristics of the discharge, the receiving water characteristics and the discharge location. Based on this review we conclude that the discharge does not have a reasonable potential to cause the loss of sensitive or important habitat, substantially interfere with existing or characteristics uses, result in damage to the ecosystem or adversely affect public health.

5. The discharge/receiving water mixture must not exceed water quality criteria outside the boundary of a mixing zone.

Ecology conducted a reasonable potential analysis, using procedures established by the EPA and by Ecology, for each pollutant. We concluded the discharge/receiving water mixture will not violate water quality criteria outside the boundary of the mixing zone.

6. The size of the mixing zone and the concentrations of the pollutants must be minimized.

At any given time, the effluent plume uses only a portion of the acute and chronic mixing zone, which minimizes the volume of water involved in mixing. The plume rises through the water column as it mixes therefore much of the receiving water volume at lower depths in the mixing zone is not mixed with discharge. Similarly, because the discharge may stop rising at some depth due to density stratification, waters above that depth will not mix with the discharge. Ecology determined it is impractical to specify in the permit the actual, much more limited volume in which the dilution occurs as the plume rises and moves with the current.

Ecology minimizes the size of mixing zones by requiring dischargers to install diffusers when they are appropriate to the discharge and the specific receiving water body. When a diffuser is installed the discharge and the receiving water is more completely mixed in a shorter time period. Ecology also minimizes the size of the mixing zone (in the form of the dilution factor) using design criteria with a low probability of occurrence. For example, Ecology uses the expected 95^{th} percentile pollutant concentration, the 90^{th} percentile background concentration, the centerline dilution factor and the lowest flow occurring once in every 10 years to perform the reasonable potential analysis.

The facility continues to conduct pollution prevention activities and has completed pollution prevention projects. These activities also minimize the affects on the receiving waters.

Because of the above reasons, Ecology has effectively minimized the size of the mixing zone authorized in the proposed permit.

7. Size of mixing zone.

The authorized mixing zone does not exceed the maximum size restriction.

8. Acute Mixing Zone.

- **The discharge/receiving water mixture must comply with acute criteria as near to the point of discharge as practicably attainable.**

  Ecology determined the acute criteria will be met at 10% of the distance (or of the chronic mixing zone at the ten year low flow.

- **The pollutant concentration, duration and frequency of exposure to the discharge, will not create a barrier to migration or translocation of indigenous organisms to a degree that has the potential to cause damage to the ecosystem.**

As described above the toxicity of any pollutant depends upon the exposure, the pollutant concentration and the time the organism is exposed to that concentration. Authorizing a limited acute mixing zone for this discharge assures that it will not create a barrier to migration. The effluent from this discharge will rise as it enters the receiving water, assuring that the rising effluent will not cause translocation of indigenous organism near the point of discharge (below the rising effluent).

- **Comply with size restrictions.**

The mixing zone authorized for this discharge complies with the size restrictions published in chapter 173-201A WAC.

9. Overlap of Mixing Zones

This mixing zone does not overlap another mixing zone.

DIOXIN REQUIREMENTS

On June 9, 1989, Ecology listed Georgia Pacific at Camas, formerly Fort James Camas LLC, and 7 other pulp mills as violating water quality standards for dioxin 2,3,7,8 TCDD pursuant to Section 304(1) of the Clean Water Act. The Act required that EPA issue an Individual Control Strategy be issued to each contributing discharger contributing to such violation, and that the discharger correct the violation be corrected within three years of Individual Control Strategy issuance.

EPA Region X issued a public notice on June 15, 1990 of the Proposed Establishment of a TMDL to Limit Discharges of Dioxin to the Columbia River. EPA acted since the Columbia River contained amounts of dioxin which exceeded applicable water quality standards.

To meet the water quality standard, EPA determined that it should allocate a daily maximum of 1.31 mg/day should be allocated to the Georgia Pacific Camas Mill. The limit is low enough that dioxin would be below the detection limit in the final effluent (10 ppq), and thus EPA required the mill to sample the bleach plant discharge. EPA estimated there would be an overall 95% reduction in dioxin discharges from the Columbia River basin bleached pulp mills.

D. DESCRIPTION OF THE RECEIVING WATER

The facility discharges to the Columbia River. Characteristic water uses include fish and shellfish spawning and rearing, harvesting, commerce and navigation, domestic and industrial water supply, and general recreation and aesthetic enjoyment (Table 602 – WAC 173-201A). Compliance with the permit conditions should not result in degradation of water quality or impair any beneficial uses.

The ambient background data used for this permit includes the following parameters:

Table 5 Ambient Background Values

Parameter	Value used
Temperature (highest annual 1-DMax) @ 90 percentile	21.80^{o}C*
Temperature (highest annual 7-DADMax) @ 90 percentile	21.50^{o}C*
pH (high)	7.75 SU**
Total Ammonia-N	0.01 mg/L**
Turbidity	1.8 NTU**
Nitrates	0.176 mg/L**

** Calculated from the 2002 and 2006 temperature and effluent flow data and the receiving water data sent by Georgia Pacific, August 2006.*

*** Taken from Ecology River and Stream data at Washougal, October 2007.*

E. DESIGNATED USES AND SURFACE WATER QUALITY CRITERIA

Applicable designated uses and surface water quality criteria are defined in chapter 173-201A WAC. In addition, the U.S. EPA set human health criteria for toxic pollutants (40 CFR 131.36). Criteria applicable to this facility's discharge are summarized below in **Table 6**.

Table 6 Aquatic Life Uses & Associated Criteria

Salmonid Spawning, Rearing, And Migration	
Temperature Criteria – Highest 7DAD MAX	20°C (68°F) Temperature shall not exceed a 1-day maximum (1-DMax) of 20.0°C due to human activities. When natural conditions exceed a 1-DMax of 20.0°C, no temperature increase will be allowed which will raise the receiving water temperature by greater than 0.3°C; nor shall such temperature increases, at any time, exceed 0.3°C due to any single source or 1.1°C due to all such activities combined.
Dissolved Oxygen Criteria – Lowest 1 Day Minimum	Dissolved oxygen shall exceed 90 percent of saturation.
Turbidity Criteria	• 5 NTU over background when the background is 50 NTU or less; or • A 10 percent increase in turbidity when the background turbidity is more than 50 NTU
Total Dissolved Gas Criteria	Total dissolved gas must not exceed 110 percent of saturation at any point of sample collection

pH Criteria	pH must be within the range of 6.5 to 8.5 with a human-caused variation within the above range of less than 0.5 units
Special condition - special fish passage exemption as described in WAC 173-201A-200 (1)(f)	

Table 7 Recreational Uses & Associated Criteria

Recreational use	Criteria
Primary Contact Recreation	Fecal coliform organism levels must not exceed a geometric mean value of 100 colonies /100 mL, with not more than 10 percent of all samples (or any single sample when less than ten sample points exist) obtained for calculating the geometric mean value exceeding 200 colonies /100 mL

- The **water supply use**s are domestic, agricultural, industrial, and stock watering.
- The **miscellaneous fresh water use**s are wildlife habitat, harvesting, commerce and navigation, boating, and aesthetics.

F. EVALUATION OF SURFACE WATER QUALITY-BASED EFFLUENT LIMITS FOR NUMERIC CRITERIA

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field pollutants--their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as biological oxygen demand (BOD) is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating surface water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

Pollutant concentrations in the proposed discharge exceed water quality criteria despite using technology-based controls which Ecology determined fulfills AKART. Ecology therefore authorizes a mixing zone in accordance with the geometric configuration, flow restriction, and other restrictions imposed on mixing zones described in chapter 173-201A WAC.

Chronic Mixing Zone

WAC 173-201A-400(7)(a) specifies that mixing zones must not extend in a downstream direction from the discharge ports for a distance greater than 300 feet plus the depth of water over the discharge ports or extend upstream for a distance of over 100 feet, not utilize greater than **25%** of the flow, and not occupy greater than **25%** of the width of the water body.

The horizontal distance of the chronic mixing zone is 345 feet down stream and 100 feet upstream. The mixing zone extends from the river bottom to the top of the water surface.

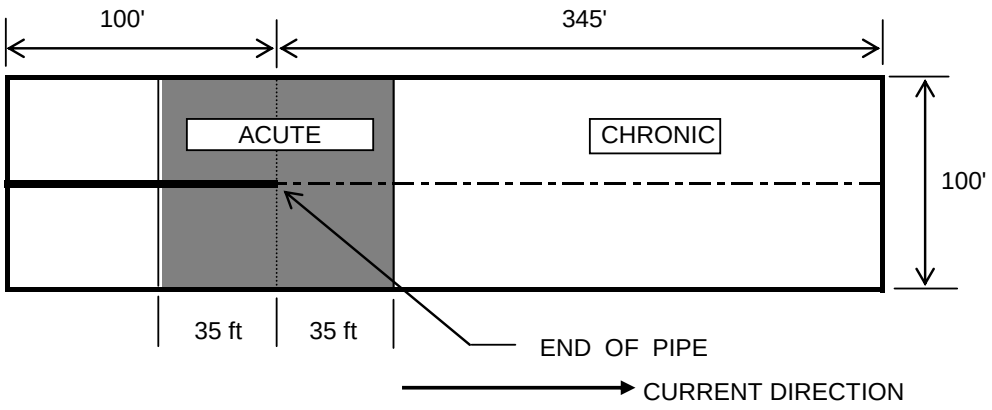
Acute Mixing Zone

WAC 173-201A-400(8)(a) specifies that in rivers and streams a zone where acute toxics criteria may be exceeded must not extend beyond 10% of the distance towards the upstream and downstream boundaries of the chronic zone, not use greater than **2.5%** of the flow and not occupy greater than **25%** of the width of the water body.

The acute mixing zone for Outfall 001 extends 35 feet in any spatial direction from any discharge port. The dilution factor is based on this distance.

The existing mixing zone is depicted as follows:

Figure 1- Mixing Zones Illustration with Dimensions



Georgia Pacific Camas Mill's consultant determined the dilution factors of effluent to receiving water that occur within these zones at the critical condition using UM3 model in the Plumes platform. The dilution factors are listed in Table 8:

Table 8 Dilution Factors (DF)

Criteria	Acute	Chronic
Aquatic Life	8.7	70.2
Human Health, Carcinogen		70.2
Human Health, Non-carcinogen		70.2

Ecology determined the impacts of temperature, pH, and ammonia as described below, using the dilution factors in the above table. The derivation of surface water quality-based limits also takes into account the variability of pollutant concentrations in both the effluent and the receiving water.

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field pollutant – their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as BOD is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating surface water quality based effluent limits varies with the point at which the pollutant

has its maximum effect. The derivation of surface water quality based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water.

The critical condition for the Columbia River is the seven-day average low river flow with a recurrence interval of ten years (7Q10). Ambient data, at critical conditions in the vicinity of the mill outfall, were collected during low water surveys in 2004 and previous years. Effluent data covered a full year of monitoring (2004) are shown in Table 9. The modeling assumptions are as follows:

Table 9 – Values used for the 3PLUME Model Input (2004)

Parameter	Value Used*
7Q10 Low Flow	80,900 cubic feet per second
Ambient Current (Minimum)	0.57 ft/s
Farfield Dispersion Coefficient	0.014
Depth at Discharge	49.6 feet
Background Temperature (no depth variation)	21.4^{o}C
Effluent Flow Rate	
• September 1, 2004	34.5 mgd
• Chronic	45.9 mgd
• Acute	57.5 mgd
Effluent Temperature	
• September 1, 2004	26.4^{o}C
• Chronic	30.4 ^{o}C
• Acute	31.1 ^{o}C

* Mixing Zone Temperature Evaluation and Dilution Ratio Study, Parametrix, November 2004

The impacts of dissolved oxygen deficiency, temperature, pH, fecal coliform, chlorine, ammonia, metals, and other toxics were determined as shown below, using the dilution factors at critical conditions described above.

BOD_5 – Under critical conditions, there is no predicted violation of the Water Quality Standards for Surface Waters. Therefore, the technology based effluent limitation for BOD_5 was placed in the permit.

Temperature – The state temperature standards include multiple criteria, each with different durations of exposure and points of application. Ecology evaluates each criterion independently to determine reasonable potential and permit limits.

- Temperature Chronic Effects

a) Annual summer maximum.

The annual maximum temperature criteria, 20ºC, protect specific categories of aquatic life by controlling the effect of human actions on summer temperatures. This criterion must be met at the edge of the chronic mixing zone boundary. Freshwater criteria are expressed as the highest seven-day average of the daily maximum temperatures (7-DADMax). The 7-DADMax temperature is the arithmetic average of seven consecutive measures of daily maximum temperatures.

Ecology listed the Columbia River at the point of Georgia Pacific's discharge for temperature in the 2004 303(d) listing. Since the temperature of Columbia River is above the criteria, no further measurable increase in temperature is allowed due to human activities. The incremental increase in temperature due to human cause can be no larger than 0.3 ° C. The 2003 permit required the Permittee to perform a two year monitoring study to determine if its discharge impacted the receiving water below the point of discharge. Georgia Pacific monitored temperature of the receiving water upstream and downstream of the discharge near the surface, at mid depth, and near the bottom in the summer months between June and September of each of the two years of the study. Georgia Pacific submitted the final report for the river study to Ecology on August 28, 2006. Georgia Pacific also monitored the effluent temperature and effluent flow for permit compliance. The following table gives the results of the study determined by subtracting the measured upstream value from the measured downstream value for each depth:

Table 10 – Temperature changes at Different Transect

Depth	Acute Delta T	Chronic Delta T
Upper DataSonde	+ 0.01	- 0.06
Middle DataSonde	+0.05	+ 0.02
Bottom DataSonde	+0.23	- 0.07

Considering that the accuracy of the temperature recording devices may vary by up to ± 0.01°C, Ecology concluded that Georgia Pacific's discharge resulted in a minimal measurable difference in temperature between the upstream and downstream temperatures.

Temperature and Outfall History – Georgia Pacific at Camas discharges "treated effluent", via an outfall extending 384 feet into the Columbia River at the River Mile 120. The outfall consists of a 60-inch-diameter concrete cylinder pipe terminating in a single, 60-in-diameter port with a 45-degree upward angle. The mill selected a single port due to strong subsurface turbulence in the Columbia River near the effluent discharge, which provides better dilution. Water depth over the outfall varies (minimum is approximately 50 feet) with river flow and tidal stage. T he outfall was recently inspected by a diver who confirmed it was fully functional.

During the temperature characterization study in 2002-2004, Parametrix measured the water temperature along vertical transects at distances between as close as 55 feet upstream to approximately 350 feet downstream from the diffuser. The goal was to identify the incremental temperature – that is, the increase in water temperature above the ambient temperature upstream of the diffuser. The results of these measurements indicated that the incremental temperature increased from approximately 0.23°C at a downstream distance of 35 feet to no measurable

impact at around the points of 350 feet downstream of the diffuser. Parametrix also measured the current velocity over depths of 1 to 49 feet. Typical velocities ranged from 0.56 meters per second (1.3 feet per second) at the surface to 1.00 meters per second (3.28 feet per second) near the riverbed.

Parametrix (2004) also employed a numerical model to evaluate the impacts of the diffuser at the mixing zone boundary. The contractor used the 3PLUMES predict nearfield and farfield mixing regions. Mixing in the nearfield is vigorous as discharge momentum from the outfall/diffuser port dissipates quickly, which is characterized by physical property of the port, including size, shape, orientation. Other properties affect the nearfield mixing also include velocity of effluent and receiving water, buoyancy of the effluent in relation to the surrounding waters. Dispersion of the farfield is driven by turbulent transport in the receiving waters, current speed, river depth, bottom roughness, river bends and eddies. Farfield mixing rates are typically less than nearfield mixing rates.

The consultant used the USEPA computer model 3PLUMES to predict nearfield mixing. 3PLUMES, based in part on the same theory as the UDKHDEN model, is an interface linking the nearfield module Update MERGE (UM) with a farfield module based on Brooks Equation (Fischer, H. B., et al. 1979). 3PLUMES is ideally suited to buoyant discharges into deep receiving waters like Georgia Pacific at Camas discharges into the Columbia River. Model runs at both acute and chronic conditions predict temperature increase within 0.3°C. Parametrix also evaluated the near-field impacts and calculated the duration of exposure to elevated temperatures based on the diffuser's jet flow velocity. The evaluation concluded: a very low likelihood of fish being entrained in a thermal plume at temperatures exceeding 33°C for more than 2 seconds. This model predicts the plume centerline chronic and acute temperatures are 30.40°C and 31.10°C, respectively.

Current Modeling Assumptions – The mill' consultant evaluated effects of thermal loading to the Columbia from mill effluent as part of this permit renewal process using conservative modeling assumptions. The effluent discharge flow and temperature both generally peak during the summer months. The mean wastewater treatment plant (WWTP) effluent discharge in September 2004 was 34.5 mgd. Also, the model showed effluent flow rates at chronic and acute conditions were 45.9 mgd and 57.5 mgd, respectively. This effluent flow rate used by the model is higher in comparison with 28 mgd for the years of 2005-2007.

The mean Columbia River flow (halfway between extremes) as measured from calendar year 1960 through year 2005, was 168,000 cubic feet per second (cfs). The average river flow during the field study (162,000 cfs) was significantly greater than the minimum dry season average daily discharge of 90,000 cfs release from the Bonneville Dam and is assumed to be 7Q10 flow rate. The 7Q10 is the lowest average flow measured over seven consecutive days that occurs on average once in ten years.

1. Modeling Results – The near-field thermal impacts of the Georgia Pacific at Camas thermal outfall in the Columbia River were evaluated numerically using the 3PLUMES model. The port was simulated as single-port outfall to obtain a conservative evaluation of the downstream thermal impacts.

Parametrix conducted the field study (an in-situ condition) and ran the 3PLUMES for in situ, chronic and acute conditions. The results shown in the following table predict plume centerline temperature of 21.47ºC, 21.54ºC, and 21.57ºC, respectively at the chronic mixing zone boundary. These modeled temperatures at the chronic mixing zone boundary are all within 0.3ºC of the ambient temperatures enter into the model.

Table 11 – 3PLUMES Model Plume Depth Temperature Values

Distance (ft)	Plume Depth (ft)			Plume Centerline Temperature (ºC)			Plume Centerline Temperature change [a] (ºC)		
	In-Situ	Chronic	Acute	In-Situ	Chronic	Acute	In-Situ	Chronic	Acute
0	54.5	54.5	54.5	26.40	30.40	31.10	5.00	9.00	9.70
35	44.0	33.4	31.2	21.89	22.35	22.52	0.49	0.95	1.12
50	41.7	28.2	25.0	21.77	22.03	22.14	0.37	0.63	0.74
100	36.2	14.6	9.5	21.61	21.73	21.81	0.21	0.33	0.41
200	27.8	Surface	Surface	21.51	51.58	21.64	0.11	0.18	0.24
350	17.7	Surface	Surface	21.47	21.54	21.57	0.07	0.14	0.17

[a] Above Ambient at 21.40ºC, field data measurement collected 35 ft upstream of the Outfall 001

Temperature Acute Effects

a) Instantaneous lethality to passing fish.
The upper 99th percentile daily maximum effluent temperature must not exceed 33°C; unless a dilution analysis indicates ambient temperatures will not exceed 33°C for 2-seconds after discharge. The 99th percentile effluent temperature is 30.97°C during the summer months of 2006-2007 submitted to Ecology. The highest effluent (critical) temperatures are less than 33°C; therefore, the Permittee meets the 33°C criteria at the end of the pipe. Therefore, there is no reasonable potential to entrain organisms in an area of near instantaneous lethality for passing fish.

b) General lethality and migration blockage.
Some waters are naturally incapable of meeting their assigned threshold temperature criteria. At locations and times when a threshold criterion is being exceeded due to natural conditions, all human sources, considered cumulatively, must not warm the water more than 0.3°C above the naturally warm condition.

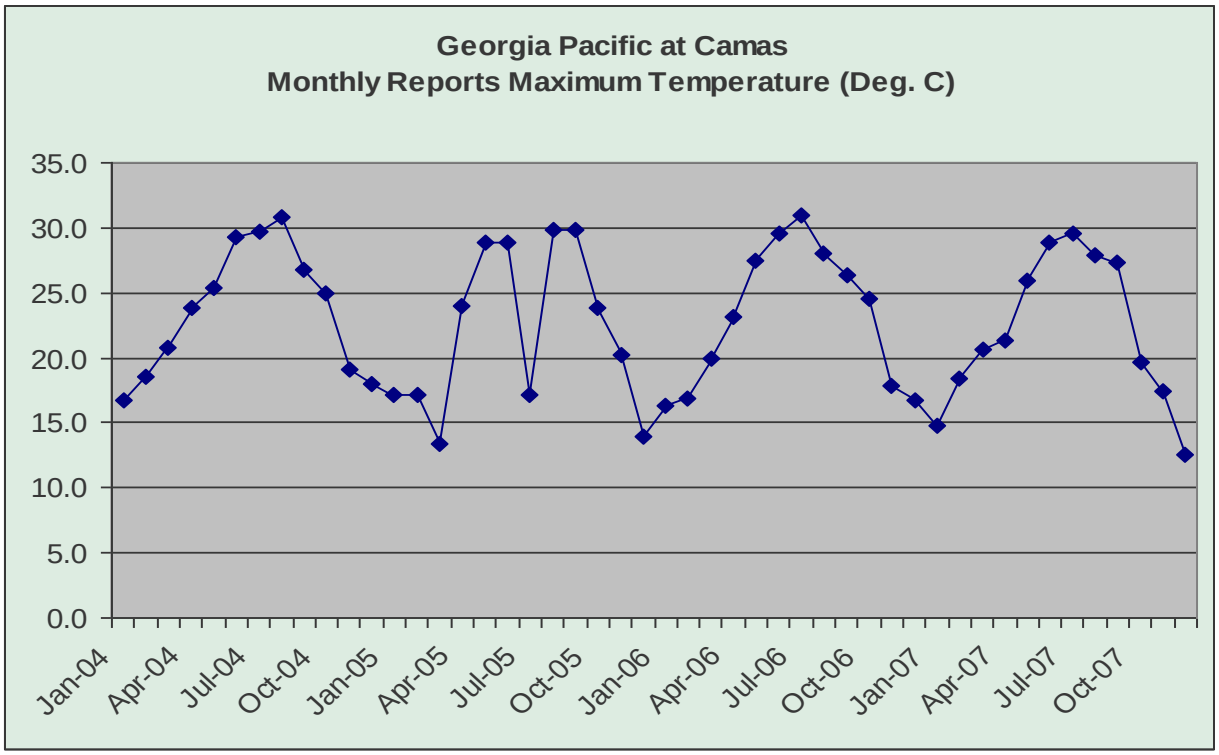
While Ecology has not yet completed a TMDL, our policy allows each point source to warm water at the edge of the chronic mixing zone by 0.3°C. This is true regardless of the background temperature and even if doing so would cause the temperature at the edge of a standard mixing zone to exceed the numeric threshold criteria. Allowing a 0.3°C warming for each point source is reasonable and protective where the dilution factor is based on 25 percent or less of the critical flow. This is because the fully mixed effect on temperature will be only a fraction (0.075°C or less) of the 0.3°C cumulative allowance for all human sources combined.

Measurable (0.3°C) increases in temperature at the edge of a chronic mixing zone are not allowed when the receiving water temperature exceeds either a 1DMax of 23°C or a 7DADMax of 22°C. Moderately acclimated adult and juvenile salmonids will generally be protected from acute lethality by discrete human actions maintaining 7-DADmax temperature at or below 22ºC and 1-DMax temperature at or below 23ºC (Chapter 173-201A WAC). The 7DADMAX and the 1DMAX receiving water temperature for this location are 21.50°C and 21.80ºC, respectively. Therefore, there is no instantaneous lethality and barriers to migration fish.

It is in the mill's economic self interest to conserve energy where possible. The effluent temperature graph below displays recent mill effluent temperature history which confirms the self-implementing energy conservation – effluent volume reduction of 6.5 mgd between 2003 and 2006 and almost in half since the mid 1990 while promoting opportunities for heat reclamation opportunities within the mill process. The mill completed a number of water reduction, heat reclamation, and manufacturing process modification projects in recent years.

The reduction of effluent flow to the aerated stabilization basin generally reduces both the heat load to ASB and to the river. Reducing heat load to the wastewater treatment, though, does not result in a corresponding decrease in temperature of effluent to the river because the final discharge temperature is primarily impacted by the ambient air temperature and especially true for the large ASB at the Camas mill (URS 2007).

Figure 2 – Monthly Maximum Effluent Temperature (2004-2007)



pH -- Under critical conditions, there is no predicted violation of the Water Quality Standards for Surface Waters. Therefore, the technology based effluent limitations for pH was placed in the

permit. The Permittee will monitor the final effluent pH. Any excursions below 5.0 or above 10.0 will be considered as violations. Continuous monitoring, recording, and reporting of the pH are permit requirements for Outfalls 001 and 002.

Toxic Pollutants --Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology based effluent limits. Facilities with technology based effluent limits defined in regulation are not exempted from meeting the Water Quality Standards for Surface Waters or from having surface water quality based effluent limits.

A reasonable potential analysis (See Appendix C) was conducted on the parameters reported in the Permittee's application which were above detection limits and for which water quality or human health standards exist. See Appendix C for this analysis. The parameters were evaluated at critical conditions with procedures given by EPA. The parameters used in the critical condition modeling are as follows: acute dilution factor 1**:**8.7, chronic dilution factor 1:70.2, receiving water temperature 21.5ºC (7-DMax), receiving water alkalinity 140 (as mg $CaCO_3$/L). Background concentrations of toxic pollutants were used in the reasonable potential to exceed analysis.

Water quality criteria for metals in Chapter 173-201A WAC are based on the dissolved fraction of the metal. The Permittee may provide data clearly demonstrating the seasonal partitioning of the dissolved metal in the ambient water in relation to an effluent discharge. Metals criteria may be adjusted on a site-specific basis when data is available clearly demonstrating the seasonal partitioning in the ambient water in relation to an effluent discharge.

Metals criteria may also be adjusted using the water effects ratio approach established by USEPA, as generally guided by the procedures in USEPA Water Quality Standards Handbook, December 1983, as supplemented or replaced.

Arsenic Discussion – In 1992 the USEPA adopted risk-based arsenic criteria for the protection of human health for the State of Washington. The criterion for marine waters is 0.14 µg/L inorganic arsenic, and is based on exposure from fish and shellfish tissue ingestion. The freshwater criterion is 0.018 µg/L, and is based on exposure from fish and shellfish tissue and water ingestion. These criteria have caused confusion in implementation because they differ from the drinking water maximum contaminant level (MCL) of 50 µg/L, which is not risk-based, and because the human health criteria are sometimes exceeded by natural background concentrations of arsenic in surface water and ground water. A sample of outfall effluent submitted to an outside laboratory by the Permittee indicated total arsenic present at a concentration of 1.9 µg/L without inorganic concentration that Ecology wanted. There is not a readily available procedure to separate the inorganic portion from the total portion. Evaluating arsenic analysis is complicated because it is the inorganic form only that is of concern.

In relation to this issue, evaluation of compliance with human health criteria will be an ongoing activity and Ecology's current position may change in the future depending on effluent characteristics.

In Washington, when a natural background concentration exceeds the criterion, the natural background concentration becomes the criterion, and no dilution zone is allowed. This could result in a situation where natural groundwater or surface water used as a municipal or industrial source-water would need additional treatment to meet numeric effluent limits even though no arsenic was added as waste. Although this is not the case for all dischargers, we do not have data at this time to quantify the extent of the problem.

A regulatory mechanism to deal with the issues associated with natural background concentrations of arsenic in groundwater-derived drinking waters is currently lacking. Consequently, the Water Quality Program, at this time, has decided to use a three-pronged strategy to address the issues associated with the arsenic criteria. The three strategy elements are:

1. Pursue, at the national level, a solution to the regulatory issue of groundwater sources with high arsenic concentrations causing municipal treatment plant effluent to exceed criteria. The upcoming revision of the MCL for arsenic offers a national opportunity to discuss how drinking water sources can affect NPDES wastewater dischargers. This discussion should focus on developing a national policy for arsenic regulation that acknowledges the risks and costs associated with management of the public exposure to natural background concentrations of arsenic through water sources.

2. Additional and more focused data collection. The Water Quality Program will in some cases require additional and more focused arsenic data collection, will encourage or require dischargers to test for source water arsenic concentrations, and will pursue development of a proposal to have Ecology's Environmental Assessment Program conduct drinking water source monitoring as well as some additional ambient monitoring data. At this time, Washington NPDES permits will contain numeric effluent limits for arsenic based only on treatment technology and aquatic life protection as appropriate.

3. Data sharing. Ecology will share data with USEPA as they work to develop new risk-based criteria for arsenic and as they develop a strategy to regulate arsenic.

This permit does not include any limitations for arsenic. Arsenic is measured in Georgia Pacific's effluent during Ecology's sampling inspections and will be sampled by the mill during the permit term as required by in this permit. This specific data collection conforms with the current strategy of Water Quality Program.

- Ecology determines that additional arsenic data from Georgia Pacific's effluent is necessary in order for a complete evaluation to reflect a seasonal variation of the discharge and obtain sufficient data for a statistical analysis on this pollutant. The current potential to exceed determination is based heavily on two data points; one is cited earlier, and another indicates at non-detect at the method detection limit of 0.5 ppb by an independent accredited laboratory (Columbia Analytical Service 2007).

- Ecology is proposing periodic (monthly) sampling for arsenic during the first two year in this permit term starting no later six months after the effective date of this permit. Georgia Pacific will submit results in a report no later than 60 days after the completion

of the data collection program. This report will include a statistical analysis for review by Ecology.

G. WHOLE EFFLUENT TOXICITY

The water quality standards for surface waters forbid discharge of effluent that causes toxic effects in the receiving waters. Many toxic pollutants cannot be measured by commonly available detection methods. However, laboratory tests can measure toxicity directly, by exposing living organisms to the wastewater and measuring their responses. These tests measure the aggregate toxicity of the whole effluent, so this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

- *Acute toxicity tests measure mortality as the significant response* to the toxicity of the effluent. Dischargers who monitor their wastewater with acute toxicity tests find early indications of any potential lethal effect of the effluent on organisms in the receiving water.

- *Chronic toxicity tests measure various sublethal toxic responses* such as retarded growth or reduced reproduction. Chronic toxicity tests often involve either a complete life cycle test on an organism with an extremely short life cycle, or a partial life cycle test during a critical stage of a test organism's life. Some chronic toxicity tests also measure organism survival.

Ecology-accredited WET testing laboratories use the proper WET testing protocols, fulfill the data requirements, and submit results in the correct reporting format. Accredited laboratory staff know about WET testing and how to calculate an NOEC, LC_{50}, EC_{50}, IC_{25}, etc. Ecology gives all accredited labs the most recent version of Ecology Publication # WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria* (http://www.ecy.wa.gov/biblio/9580.html), which is referenced in the permit. Ecology recommends that the facility send a copy of the acute or chronic toxicity sections(s) of its NPDES permit to the laboratory.

WET testing conducted during effluent characterization showed no reasonable potential for effluent discharges to cause receiving water acute or chronic toxicity. The proposed permit will not impose an acute or chronic WET limit. Georgia Pacific must retest the effluent before submitting an application for permit renewal. In addition,

- If this facility makes process or material changes which, in Ecology's opinion, increase the potential for effluent toxicity, then Ecology may (in a regulatory order, by permit modification, or in the permit renewal) require the facility to conduct additional effluent characterization.

- If WET testing conducted for submittal with a permit application fails to meet the performance standards in WAC 173-205-020, Ecology will assume that effluent toxicity has increased. Georgia Pacific may demonstrate to Ecology that effluent toxicity has not increased, by performing additional WET testing after the process or material changes have been made.

I. HUMAN HEALTH

Washington's water quality standards include 91 numeric human health-based criteria that Ecology must consider when writing NPDES permits. These criteria were established in 1992 by the U.S. EPA in its National Toxics Rule (40 CFR 131.36). The National Toxics Rule allows states to use mixing zones to evaluate whether discharges comply with human health criteria.

Ecology conducted a determination of the discharge's potential to violate the water quality standards as required by 40 CFR 122.44(d). We followed the procedures published in the Technical Support Document for Water Quality-Based Toxics Control (EPA/505/2-90-001) and Ecology's Permit Writer's Manual (Ecology Publication 92-109, July, 2006) to make this reasonable potential determination. Our evaluation showed that the discharge has no reasonable potential to cause a violation of water quality standards, thus an effluent limit is not warranted.

I. SEDIMENT QUALITY

Ecology has promulgated aquatic sediment standards (Chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that Ecology may require Permittee to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400). Ecology has determined through a review of this monitoring that this discharge has no reasonable potential to violate the Sediment Management Standards.

J. GROUND WATER QUALITY LIMITATIONS

Ecology has promulgated Ground Water Quality Standards (Chapter 173-200 WAC) to protect beneficial uses of ground water. Permits issued by Ecology must be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100).

K. COMPARISON OF EFFLUENT LIMITS WITH LIMITS OF THE PREVIOUS PERMIT ISSUED ON APRIL 15, 2003

Table 12 – Limits Comparison

	Basis of Limit	**Previous Effluent Limits: Outfall # 001**		**Proposed Effluent Limits: Outfall # 001**	
Parameter		**Average Monthly**	**Maximum Daily**	**Average Monthly**	**Maximum Daily**
BOD_5, lbs/day	Technology	14,633	28,031	11,085	22,770
TSS, lbs/day	Technology	29,927	56,019	24,895	46,338
AOX, lbs/day	Technology	1,401	2,138	1,140	1,740
Chloroform, lbs/day	Technology	9.31	15.56	7.58	12.68

IV. MONITORING REQUIREMENTS

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being

achieved. The monitoring schedule is detailed in the proposed permit under Condition S.2. Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring.

A. MONITORING SCHEDULE AT EFFECTIVE DATE

All parameters listed in this section shall be monitored as of the effective date of this permit through January 15, 2013. The frequency of monitoring is subjectively determined in accordance with factors described in section XIII of Ecology's Permit Writer's Manual. The Permit Writer's Manual offers a Method 1 and Method 2 approach for developing monitoring frequency. Two conflicting objectives are balanced in establishing monitoring frequency. Historical good performance, which is characterized by monitoring results consistently below permitted limits, justifies reduced monitoring. Balanced against reduced monitoring is the opposite objective of frequently monitoring an industrial effluent which could impact receiving water quality under worse case scenario. For the conventional pollutants BOD and TSS, Ecology proposes a minimum monitoring frequency of 3/week even though the Permittee's past performance indicates less frequent monitoring may be statistically justified. This is consistent with the Method 1 approach outlined in Section XIII 1.3.1 of Ecology's Permit Writer's Manual. Monitoring frequency may be reduced further in subsequent permit cycles based on performance.

Ecology proposes to discontinue monitoring for COD. The facility has conducted 5 years of COD monitoring. The federal effluent guidelines do not include COD effluent limitations or monitoring requirements. The facility conducted COD monitoring during the 2003-2008 permit term for informational purposes. An additional argument against COD monitoring is that the test results in the generation of a dangerous waste.

The federal effluent monitoring guidelines set forth monitoring frequency for chlorinated organics in 40CFR Part 430.02. The 2003-2008 permit implemented the monitoring frequency stipulated by federal regulation. These same federal regulations allow adjustment in monitoring frequency after 5 years of monitoring has occurred. Ecology adjusted the monitoring frequency for many of the chlorinated organic parameters, as allowed by federal regulation.

Table 13 – Proposed Monitoring Frequency During the 2008-2013 Permit Term

Category	Parameter	Units	Sample Point (Point of Compliance)	Minimum Sampling Frequency	Sample Type
Wastewater	Flow	MGD	Final Effluent	Daily	Continuous Recording
Wastewater	BOD_5	mg/L	Final Effluent	3/week	24-hour Composite
Wastewater	TSS	mg/L	Final Effluent	3/week	24-hour Composite
Wastewater	pH	Standard Units	Final Effluent	Daily	Continuous Recording
Wastewater	Temperature	^0F	Final	Daily	Continuous

Category	Parameter	Units	Sample Point (Point of Compliance)	Minimum Sampling Frequency	Sample Type
			Effluent		Recording
	Kraft Pulp Production	ADT/Day	To the Bleach Plant	Daily	
	Paper Production	MDT/Day	At the Reel	Daily	
Wastewater	AOX	µg/L	Final Effluent	Monthly	24-hour Composite
Wastewater	Total Arsenic	µg/L	Final Effluent	Monthly for 2 years	24-hour Composite
Wastewater	TCDD	pg/L	Bleach Plant Effluent	Quarterly	24-hour Composite
Wastewater	TCDF	pg/L	Bleach Plant Effluent	Quarterly	24-hour Composite
Wastewater	TCDD	pg/L	Final Effluent	Annually	24-hour Composite
Wastewater	TCDF	pg/L	Final Effluent	Annually	24-hour Composite
Wastewater	Chloroform	µg/L	Bleach Plant Effluent	1/permit term	24-hour Composite
Wastewater	Trichlorosyringol 3,4,5-trichlorocatechol 3,4,6-trichlorocatechol 3,4,5-trichloroguaiacol 3,4,6-trichloroguaiacol 4,5,6-trichloroguaiacol 2,4,5-trichlorophenol 3,4,6-trichlorophenol Tetrachlorocatechol Tetrachloroguaiacol 2,3,4,6-tetrachlorophenol Pentachlorophenol	µg/L	Bleach Plant Effluent	1/permit term	24-hour Composite
Sludge	2,3,7,8-TCDD	ng/kg	Primary Sludge	1/permit term	Grab
	2,3,7,8-TCDF				

B. LABORATORY ACCREDITATION

With the exception of certain parameters, the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories.* The laboratory at this facility is accredited for BOD, TSS, and pH. The mill hires accredited laboratories to perform all other permit testing and data requirements.

V. OTHER PERMIT CONDITIONS

A. REPORTING AND RECORDKEEPING

The conditions of S.3 are based on the authority to specify any appropriate reporting and record-keeping requirements to prevent and control waste discharges (WAC 173-220-210).

B. NON ROUTINE AND UNANTICIPATED DISCHARGES

Occasionally, this facility may generate wastewater which was not characterized in the permit application because it is not a routine discharge and was not anticipated at the time of application. These wastes typically consist of waters used to pressure-test storage tanks or fire water systems or of leaks from drinking water systems. These generally clean wastewaters may be contaminated with pollutants.

The permit authorizes non-routine and unanticipated discharges under certain conditions. The facility must characterize the wastewater for pollutants and examine the opportunities for reuse. Depending on the nature and extent of pollutants in this wastewater and on any opportunities for reuse, Ecology may:

- Authorize the facility to discharge the water directly via the process wastewater outfall or through a stormwater outfall for clean water.
- Require the facility to treat the wastewater.
- Require the facility to reuse the wastewater.

C. SPILL PLAN

This facility stores a quantity of chemicals on-site that have the potential to cause water pollution if accidentally released. Ecology can require a facility to develop best management plans to prevent this accidental release [section 402(a)(1) of the Federal Water Pollution Control Act (FWPCA) and RCW 90.48.080].

The proposed permit requires this facility to update and implement the plan for preventing the accidental release of pollutants to state waters and for minimizing damages if such a spill occurs.

D. SOLID WASTE PLAN

Ecology has determined that Georgia Pacific Camas Mill has a potential to cause pollution of the waters of the state from leachate of solid waste. This proposed permit requires this facility to update the approved solid waste plan designed to prevent solid waste from causing pollution of waters of the state. The updated plan must be submitted to Ecology for approval (RCW 90.48.080).

E. OUTFALL EVALUATION

Ecology requires that Georgia Pacific Camas Mill conduct an outfall inspection and submit a report detailing the findings of that inspection (proposed Permit Condition S. 13). The facility must inspect its discharge pipe and diffusers to determine their physical condition and evaluate the extent of sediment accumulations in the vicinity of the outfall.

F. TREATMENT SYSTEM ADEQUACY ONGOING OPERATING PLAN

In accordance with state and federal regulations, the Permittee is required to take all reasonable steps to properly operate and maintain the treatment system (40 CFR 122.41(e)) and WAC 173-220-150 (1)(g). An operation and maintenance manual was submitted as required by state regulation in the previous permit.

Ecology believes that the implementation of the procedures in the Treatment System Operating Plan is a reasonable measure to ensure compliance with the terms and limitations in the permit. Special Condition S.1 in the permit will require the Permittee to update its Treatment System Operating Plan within six months of the permit's effective date and any major modification to the treatment system.

G. GENERAL CONDITIONS

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual industrial NPDES permits issued by Ecology.

VI. PERMIT ISSUANCE PROCEDURES

A. PERMIT MODIFICATIONS

Ecology may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards for Surface Waters, Sediment Quality Standards, or Water Quality Standards for Ground Waters, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

Ecology may also modify this permit as a result of new or amended state or federal regulations.

B. PROPOSED PERMIT ISSUANCE

This proposed permit includes all statutory requirements for Ecology to authorize a wastewater discharge. The permit includes limits and conditions to protect human health and aquatic life, and the beneficial uses of waters of the State of Washington. Ecology proposes to issue this permit for a term of 5 years.

VII. REFERENCES FOR TEXT AND APPENDICES

Environmental Protection Agency (EPA):

1991 Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.

1988 Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. U.S. EPA Office of Water, Washington, D.C.

1985 Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.

1983 Water Quality Standards Handbook. U.S. EPA Office of Water, Washington, D.C.

Tsivoglou, E. C., and J. R. Wallace.

1972 Characterization of Stream Reaeration Capacity. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

Washington State Department of Ecology:

1994 Permit Writer's Manual. Publication Number 92-109

Wright, R .M., and A .J. McDonnell:

1979 In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(EE2). (Cited in EPA 1985 op.cit.)

APPENDIX A--PUBLIC INVOLVEMENT INFORMATION

Ecology proposes to reissue a permit to Georgia Pacific Consumer Products (Camas) L.L.C. The permit prescribes operating conditions and wastewater discharge limits. This fact sheet describes the facility and Ecology's reasons for requiring permit conditions.

Ecology will place a Public Notice on August 12, 2008 to inform the public and to invite comment on the proposed reissuance of this National Pollutant Discharge Elimination System permit as drafted.

The Notice –

- tells where copies of the draft Permit and Fact Sheet are available for public evaluation (a local public library, the closest Regional or Field Office, posted on our website.).
- offers to provide the documents in an alternate format to accommodate special needs.
- asks people to tell us how well the proposed permit would protect the receiving water.
- invites people to suggest fairer conditions, limits, and requirements for the permit.
- invites comments on Ecology's determination of compliance with antidegradation rules.
- urges people to submit their comments, in writing, before the end of the Comment Period
- tells how to request a public hearing of comments about the proposed NPDES Permit.
- explains the next step(s) in the permitting process.

Ecology has published a document entitled **Frequently Asked Questions about Effective Public Commenting** which is available on our website at http://www.ecy.wa.gov/biblio/0307023.html.

You may obtain further information from Ecology by telephone, Teddy Le at 360-407-6948 or by writing to the permit writer at the address listed below.

Teddy V. Le, P.E.
Department of Ecology
Industrial Section
Solid Waste and Financial Assistance
PO Box 47600
Olympia, WA 98504-7600

The primary author of this permit and fact sheet is Teddy Le.

APPENDIX B

GLOSSARY

Acute Toxicity--The lethal effect of a compound on an organism that occurs in a short period of time, usually 48 to 96 hours.

AKART-- An acronym for "all known, available, and reasonable methods of treatment."

Ambient Water Quality--The existing environmental condition of the water in a receiving water body.

Ammonia—High concentrations of ammonia are toxic to aquatic organisms. They exert an oxygen demand and contribute to eutrophication. The Camas Mill wastewater has very little ammonia, so nitrogen compounds are added to the effluent to facilitate biological treatment.

Average Monthly Discharge Limitation --The arithmetic average of the measured values obtained over a calendar month's time.

Best Management Practices (BMPs)--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

BOD_5--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD_5 is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

Bypass--The intentional diversion of waste streams from any portion of a treatment facility.

Chlorine--Chlorine is used to disinfect potable water, industrial water, and domestic sewage for pathogens harmful to human health.

Chronic Toxicity--The effect of a compound on an organism over a relatively long time, often 1/10 of an organism's life span or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

Clean Water Act (CWA)--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

Compliance Inspection - Without Sampling--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

Compliance Inspection - With Sampling--A site visit to accomplish the purpose of a compliance inspection--without sampling, and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits and, for municipal facilities, sampling of influent to ascertain compliance with the 85% removal requirement. Additional sampling may be conducted.

Composite Sample--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots.

Construction Activity--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

Continuous Monitoring –Uninterrupted, unless otherwise noted in the permit.

Critical Condition--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water or the impairment of beneficial uses. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

Dilution Factor--A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the percent effluent fraction, e.g., a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

EC_{50} (Effective Concentration, 50%)--Means the effluent concentration estimated to cause an adverse effect in 50% of the test organisms in a toxicity test involving a series of dilutions of effluent.

Engineering Report--A document which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report must contain the appropriate information required in WAC 173-240-060 or 173-240-130.

Fecal Coliform Bacteria--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated domestic sewage and/or the presence of animal feces.

Grab Sample--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

IC_{50} (Inhibition Concentration, 50%)--Means the effluent concentration estimated to cause a 50% reduction in a biological function in a toxicity test involving a series of dilutions of effluent.

Industrial Wastewater--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

LC_{50} (Lethal Concentration, 50%) means the effluent concentration estimated to cause death in 50% of the test organisms in a toxicity test involving a series of dilutions.

Major Facility--A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Maximum Daily Discharge Limitation--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

Method Detection Level (MDL)--The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

Minimum Level (ML)—The level at which an analytical system gives a recognizable signal and an acceptable calibration point.

Minor Facility--A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

Mixing Zone--An area that surrounds an effluent discharge within which water quality standards may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in state regulations (Chapter 173-201A WAC).

NOEC (No Observed Effect Concentration)--The highest measured continuous concentration of an effluent or a toxicant that causes no observed effect on a test organism.

National Pollutant Discharge Elimination System (NPDES)--The NPDES (Section 402 of the Clean Water Act) is the Federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both State and Federal laws.

pH--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

Quantitation Level (QL)--A calculated value five times the MDL (method detection level).

Responsible Corporate Officer--A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or have gross annual sales or expenditures exceeding $25 million (in second quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures (40 CFR 122.22).

Technology-based Effluent Limit--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

Total Suspended Solids (TSS)--Total suspended solids is the particulate material in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

State Waters--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, and all other surface waters and watercourses within the jurisdiction of the State of Washington.

Stormwater--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a stormwater drainage system into a defined surface water body or a constructed infiltration facility.

Upset--An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

Water Quality Based Effluent Limit--A wastewater parameter concentration limit that is intended to prevent the concentration of that parameter from exceeding a water quality standard after it is discharged into a receiving water.

APPENDIX C – TECHNICAL CALCULATIONS

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found on Ecology's homepage at http://www.ecy.wa.gov.

Ecology includes herein applicable spreadsheets to the Georgia Pacific Camas Mill.

- Reasonable Potential for Water Quality Criteria, and
- Reasonable Potential for Protection of Human Health.

APPENDIX D – RESPONSE TO COMMENT

WASHINGTON DEPARTMENT OF ECOLOGY
RESPONSE TO PUBLIC COMMENTS
GEORGIA PACIFIC CONSUMER PRODUCTS (CAMAS) LLC
NPDES PERMIT WA 00025-6
December 29, 2008

Ecology published the public notice for issuance of the Georgia Pacific Camas Mill proposed NPDES Permit on August 12, 2008 with a closing date of September 12, 2008. Ecology received a comment letter dated September 11, 2008 from the Columbia Riverkeeper (CRK) represented by Lauren R, Goldberg. Georgia Pacific Camas Mill sent Ecology a comment letter dated September 8, 2008.

Ecology completed its review of the comments, made changes to the permit, where appropriate and describes these changes in this response to comment document. Ecology also modified the fact sheet to include additional information not available in the draft fact sheet for clarification purposes. Ecology will send a copy of this document in its entirety and the revised permit to commenter's of the draft documents.

Columbia Riverkeeper comments on Proposed NPDES Permit WA 000298-4

The Columbia Riverkeepers provided some general commentary on Ecology's responsibilities under state and federal law to protect water quality on pages one through four of the attached letter dated September 11th, 2008. Ecology provides responses to the specific permit questions and comments below.

CRK Question #1

Has DOE considered the annual toxic load the Draft Permit authorizes Georgia Pacific to discharge into the Columbia River each year?

Response #1:

Ecology has considered the toxic load to the river discharge from the Georgia Pacific Camas Mill through various testing programs and environmental report as required in the NPDES permit, Condition S3. In addition, Ecology considers the instantaneous effect of the toxic load of the effluent by utilizing the reasonable potential to exceed analysis described in Ecology's Permit Writer Manual. The reasonable potential analysis determines whether the authorized discharge will meet water quality and health quality standards. Ecology has evaluated the mill's effluent for its reasonable potential to exceed the Water Quality Standards (WQS) for both the ALC (aquatic life criteria) and the HHC (human health criteria). Ecology also evaluated results of previous effluent bioassays studies. Using this information and WAC 173-201A, Ecology made a determination that the effluent has no reasonable potential to exceed both the aquatic life

and the human heath criteria from the mill's treated effluent.

Ecology could calculate the annual toxic load from Georgia Pacific, however, does not see the value of doing so. Ecology would need to consider the mass quantity of pollutants discharged in relation to other discharges and natural concentrations to provide a meaningful analysis. This type of consideration occurs when water or organism pollutant levels exceed criteria values such as for temperature or dioxin. When pollutant levels in the river or organisms exceed criteria, Ecology places the river on the agency 303(d) list and conducts a total maximum daily load (TMDL) analysis to determine sources of the pollutant. The TMDL assigns waste load allocations to point source discharges, if necessary, and permit writers use those waste load allocations to formulate effluent limits.

CRK Question #2:

Has DOE considered the cumulative effect of Georgia Pacific's permitted toxic load of arsenic with other point and nonpoint sources of arsenic?

Response #2:

This draft permit does not address the cumulative effect of toxic load with other sources to the receiving waters. To do so would require Ecology to complete a total maximum daily load (TMDL) analysis for arsenic in the Columbia River. The Columbia River is not listed for arsenic in the vicinity of the mill, although the current and proposed 303(d) list includes some areas of concern for arsenic both upstream and downstream of the discharge. Because the River is not listed for arsenic Ecology has no plans to conduct a TMDL for arsenic.

Ecology considered the individual impacts of the Georgia Pacific Mill by: 1) evaluating the reasonable potential to exceed the Water Quality Standards (WQS) with current representative sampling results; 2) including chemical, physical, and biological monitoring and reporting requirements; 3) evaluating mill-specific Receiving Water Study, which included clean sampling techniques, as prescribed in EPA Method 1669: Sampling Ambient Water for Trace Metals at EPA Water Quality Levels (US-EPA 1995); 4) whole effluent toxicity (WET) testing on various concentrations of the effluent which included 100 percent effluent concentration.

The results of the reasonable potential calculations reveal to Ecology that the effluent does not have a reasonable potential to exceed WQS for several metals, chromium, copper, lead, arsenic, aluminum, or nickel or zinc. The following table shows the results.

OUTFALL 001 (SECONDARY TREATMENT DISCHARGE):
REASONABLE POTENTIAL CALCULATIONS
METALS

Pollutants	Acute Pollutant Concentration	WQC_{acute} (ug/L)	RPE_{acute}?	Chronic Pollutant Concentration	$WQC_{chronic}$	$RPE_{chronic}$?
Chromium	2.361	358.2	**NO**	0.597	116.2	**NO**
Copper	2.742	10.4	**NO**	1.454	7.3	**NO**

Lead	0.151	36.5	**NO**	0.056	1.4	**NO**
Zinc	4.130	73.6	**NO**	1.487	67.2	**NO**
Aluminum	242.230	750	**NO**	**N/A**	**N/A**	**N/A**
Dissolved Arsenic	0.327	360	**NO**	0.041	190	**NO**
Nickel	4.977	1881.51	**NO**	0.616	208.96	**NO**

Ecology uses whole effluent toxicity (WET) testing which measures the synergistic toxic impacts of effluent to various sensitive species in the Columbia River. The water quality standards for surface waters forbid discharge of effluent that causes toxic effects in the receiving waters. One cannot measure many toxic pollutants by commonly available detection methods. However, laboratory tests can measure toxicity directly, by exposing living organisms to the wastewater and measuring their responses. These tests measure the aggregate toxicity (synergy effect/accumulative effect) of the whole effluent; hence this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and others measure chronic toxicity.

- Acute toxicity tests measure mortality as the significant response to the toxicity of the effluent. Dischargers who monitor their wastewater with acute toxicity tests find early indications of any potential lethal effect of the effluent on organisms in the receiving water.

- Chronic toxicity tests measure various sublethal toxic responses such as retarded growth or reduced reproduction. Chronic toxicity tests often involve either a complete life cycle test on an organism with an extremely short life cycle, or a partial life cycle test during a critical stage of a test organism's life. Some chronic toxicity tests also measure organism survival.

Ecology-accredited WET testing laboratories use the proper WET testing protocols, fulfill the data requirements, and submit results in the correct reporting format. Throughout the permit cycle, WET testing conducted by Georgia Pacific Camas Mill during effluent characterization representing the current operating conditions showed no reasonable potential for effluent discharges to cause receiving water acute or chronic toxicity. The results of the tests are shown in the tables below.

OUTFALL 001 (SECONDARY TREATMENT DISCHARGE):

ACUTE BIOASSAY SUMMARY, 2003–2007

Species [a]	Sample Date	Survival [b]		Endpoint Toxic Units	LC_{50} [c] %
		0% Effluent	100% Effluent		
Ceriodaphnia dubia	4/21/03	95	100	0	>100
	6/02/03	100	100	0	>100
	7/07/03	97.5	90	0	>100
	9/02/03	95	100	0	>100
	10/13/03	100	100	0	>100
	1/19/04	95	100	0	>100

	3/15/04	100	100	0	>100
	4/05/04	90	95	0	>100
	2/19/07	100	100	0	>100
	6/11/07	90	100	0	>100
	Median	96.3	100	0	>100
Pimephales promelas	4/21/03	100	97.5	0.23	>100
	6/02/03	100	100	0.00	>100
	7/07/03	100	100	0.59	>100
	9/02/03	97.5	92.5	0.51	>100
	10/13/03	97.5	92.5	0.51	>100
	1/19/04	97.5	75.0	0.82	>100
	3/15/04	72.5	85.0	0.69	>100
	4/05/04	97.5	100	0.00	>100
	2/19/07	100	100	0.00	>100
	6/11/07	100	100	0.00	>100
	Median	98.8	98.8	0.37	>100

[a] Twenty-four hour composite samples of Outfall 001 effluent collected for the test. Acute (4 day) bioassays were completed by Weston Solutions (formerly MEC Analytical Systems in Carlsbad, California) using EPA Method 821-R-02-012, 821-R-02-013, and Ecology WQ-R-95-80.

[b] If at the end of effluent characterization the median survival in 100% effluent is less than eighty percent, or if any individual test result shows less than sixty five percent survival in one hundred percent effluent, then a reasonable potential for acute conditions in the receiving water has been demonstrated, and the whole effluent acute toxicity limit described in WAC 173-205-070 shall be applied to the discharge. The Camas Mill wastewater discharge exhibited a median 98% survival in 100% effluent (greater than 80% as a minimum required by the regulations) and 75% survival for any single test (greater than 65% as a minimum required). This 65% is for an uncertain condition of the species school before conducting the test. This can be demonstrated by the test dated 3/15/04 and 6/11/07. These showed the survival rates of the test species in the zero percent effluent concentration is less than that of one hundred percent effluent concentration.

[c] LC_{50} denotes a lethal concentration for 50% of the subject organisms under the test conditions.

OUTFALL 001: (SECONDARY TREATMENT DISCHARGE):

CHRONIC BIOASSAY SUMMARY, 2003–2007

Species [a]	Sample Date	Survival [b]		Endpoint Toxic Units	LC_{50} [c] %
		0% Effluent	100% Effluent		
Ceriodaphnia dubia	4/21,23,25/03	100	100	1	>100
	6/02,04,06/03	88.9	100	1	>100

Species [a]	Sample Date	Survival [b]		Endpoint Toxic Units	LC_{50} [c] %
		0% Effluent	100% Effluent		
	7/07,09,11/03	97.5	92.5	1	>100
	10/13,15,17/03	100	100	1	>100
	1/19,21,23/04	100	100	8	>100
	3/15,17,19/04	100	100	2	>100
	4/5, 7, 9/04	100	100	2	>100
	1/29, 31, & 2/2/07	100	100	1	>100
	6/11, 13, 15/07	100	100	1	>100
	Median	100	100	1	>100
Pimephales promelas	4/21,23,25/03	100	100	1	>100
	6/02,04,06/03	97.5	95	1	>100
	7/07,09,11/03	70	90	1	>100
	10/13,15,17/03	100	100	1	>100
	1/19,21,23/04	100	100	1	>100
	3/15,17,19/04	90	87.5	1	>100
	4/5,7,9/04	100	100	1	>100
	1/29, 31, & 2/2/07	97.5	97.5	1	>100
	6/11, 13, 15/07	90	97.5	1	>100
	Median	97.5	97.5	1	>100

Refer to footnotes [a, b, c] above for explanation.

CRK Question #3:

Has DOE considered the cumulative effect of Georgia Pacific's permitted toxic load of aluminum with other point and nonpoint sources of aluminum?

Response #3:

Refer to Response #2. The Columbia River has no 303(d) listings for aluminum therefore Ecology has not conducted a TMDL to consider the cumulative effects of aluminum.

CRK Question #4:

Has DOE considered the cumulative effect of Georgia Pacific's permitted toxic load of nickel with other point and nonpoint sources of nickel?

Response #4:

Refer to Response #2. The Columbia River has no 303(d) listings for nickel therefore Ecology has not conducted a TMDL to consider the cumulative effects of nickel.

CRK Question #5:

Did DOE analyze &/or require that Georgia Pacific conduct a sediment study at Outfall 1? Please explain.

Response #5:

Georgia Pacific conducted sediment studies near Outfall 001 in 1988, 1989, and 1990 and a joint study as described below. near Outfall 002 in 1998. In all cases the results indicated compliance with Washington's marine sediment standards (WAC 173-204). Ecology used the marine standards because fresh water sediment standards have not been promulgated. Since the sediment studies conducted in 1998, the mill has shutdown several processes and equipment significantly reducing organic loading, effluent flow and toxic pollutant loading.

Georgia Pacific tested the effluent using sensitive species which included fathead minnow, daphnia, and water flea during the 2003-2008 NPDES permit cycle. The results showed these species' survival meet the WAC 173-201A. Ecology considered additional factors such as the current velocity at the point of discharge, the settling rate of solids in the large quiescent pond (ASB2), and the pollutant concentrations which indicated no reasonable potential to exceed the WAC 173-201A-200(1)(e). Ecology therefore concludes that there is no potential for measureable sediment contamination from the Georgia Pacific Camas Mill.

In 2006 a consortium of agencies including Ecology (Army Corps of Engineers, EPA, Idaho Department of Environmental Quality, NOAA, Oregon Department of Environmental Quality, U. S. Fish & Wildlife Service, Washington Department of Ecology, and the Washington Department of Natural Resources) completed the "Northwest Regional Sediment Evaluation Framework". The framework set screening level values (SLVs) for conventional pollutants and bioaccumulative toxins (chlorinated hydrocarbons, dioxins/furans, PCBs, pesticides, phenolics, phthalates, poly aromatic hydrocarbons, etc). Sampling and analysis of sediments around the Camas Mill found contaminant concentrations well below the screening level values (for dredging and in water disposal). Arsenic, for example, was not detected at a detection level of less than half of the SLV 1 (20 mg/kg *total* arsenic on a dry weight basis). For the reasons stated above, Ecology believes that additional sediment studies are not necessary for this permit cycle.

CRK Question #6:

Did DOE analyze if designated uses are impaired by arsenic in Georgia Pacific's discharge? Please explain.

Response #6:

Ecology has evaluated the effluent for the reasonable potential to exceed the Water Quality Standards (WQS) for both the ALC (aquatic life criteria) and the HHC (human health criteria).

The calculations indicated that the mill's treated effluent has no reasonable potential to exceed the arsenic standards.

CRK General Comment A:

The CWA requires that Ecology conduct a reasonable potential analysis that "uses procedures which account for the existing controls on point and nonpoint sources of pollution, [and] the variability of the pollutant . . ." 40 C.F.R § 122.44(d)(1)(ii). In general, the Draft Fact Sheet fails to provide DOE's reasonable potential analyses for toxic pollutants. The Draft Permit states: "A reasonable potential analysis (See Appendix C) was conducted on the parameters reported in the Permittee's application which were above detection limits and for which water quality or human health standards exist. See Appendix C for this analysis." However, Appendix C does not contain a reasonable potential analysis for any parameter reported in Georgia Pacific's application. See Draft Fact Sheet Appendix C (stating that "several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found on Ecology's homepage at http://www.ecy.wa.gov). The Draft Fact Sheet violates the CWA regulations which require that fact sheets contain "the principal facts and the significant factual, legal, methodological and policy questions considered in preparing the draft permit" 40 C.F.R § 124.8(a). This includes "the basis for the draft permit conditions including references to applicable statutory or regulatory provisions" and "a description of the procedures used for reaching a final decision on the draft permit."

The Draft Fact Sheet also violates Washington's minimum requirements for NPDES fact sheet contents. See WAC 173-220-060 (Fact sheets). Washington's regulations require that "fact sheets shall, at a minimum, summarize . . . [t]he legal and technical grounds for the draft permit determination, including an explanation of how conditions meet both technology-based and water quality-based requirements of the FWPCA and chapters 90.48, 90.52, and 90.54 RCW." WAC 173-220-060(1)(e).

Response A:

Comment noted. Ecology added the reasonable potential analyses in the revised fact sheet.

CRK Question #7:

On what basis did DOE conclude that Georgia Pacific's discharge has no reasonable potential to violate the state water quality standard for mercury?

Response #7:

Ecology has evaluated the effluent for the reasonable potential to exceed the Water Quality Standards (WQS) for both the ALC (aquatic life criteria) and the HHC (human health criteria). The analysis indicated there is no reasonable potential to exceed the mercury standards by Georgia Pacific's discharge at the edge of the acute and chronic mixing zones. Ecology included the reasonable potential analysis in the revised fact sheet.

CRK Question #8:

On what basis did DOE conclude that Georgia Pacific's discharge has no reasonable potential to violate the state water quality standard for aluminum?

CRK requests that DOE revise the Draft Fact Sheet. CRK also requests that Draft Permit to limit Georgia Pacific's discharge of mercury, aluminum and any additional toxic pollutants with a reasonable potential to violate Washington's numeric and narrative water quality standards.

Response #8:

Ecology has evaluated the effluent for the reasonable potential to exceed the Water Quality Standards (WQS) for both the ALC (aquatic life criteria) and the HHC (human health criteria). The analysis indicated there is no reasonable potential to exceed the aluminum standards by Georgia Pacific's discharge.

Ecology revised the fact sheet to include the reasonable potential analyses. Based on our analyses, Ecology determined that there were no exceedances of pollutants to the standards. Therefore, the proposed permit includes no water quality based limits.

CRK Question #9:

The Draft Fact Sheet states:

> While Ecology has not yet completed a TMDL, our policy allows each point source to warm water at the edge of the chronic mixing zone by 0.3ºC. This is true regardless of the background temperature and even if doing so would cause the temperature at the edge of the standard mixing zone to exceed the numeric threshold criteria.

What legal authority does DOE have to authorize a discharge that would cause a violation of the numeric threshold criteria at the edge of the mixing zone? Please explain.

Response #9

As noted in the fact sheet, the river is assigned a special temperature condition of 20°C as a one day maximum with an allowance of 0.3°C increase due to any single source if temperatures exceed 20°C [WAC-173-201A-602]. When a water body is warmer than the criteria and that condition is due to natural conditions, then human actions cumulatively may not cause the 7-day average of the daily maximum temperature of the river to increase more than 0.3°C [WAC 173-201A-200(1)(c)(i)]. As noted, the river is impaired for temperature and Ecology/EPA has not yet completed a TMDL. EPA's draft TMDL indicated that point source discharges were not the cause of the impairment and were minimal in comparison with other sources. Ecology does not believe that in cases such as this we should require point sources to install treatment devices before completion of the TMDL, especially since it would have an insignificant effect. In this case we have allowed Georgia Pacific, as an existing discharger, to maintain the mixing allowance until EPA completes the TMDL and Ecology assigns a waste load allocation.

The 2003 permit required the mill perform a two-year temperature monitoring study to determine if its discharge impacted the receiving water downstream the point of discharge. The results of this study indicated that Georgia Pacific's discharge resulted in a minimal measurable difference in temperature between the upstream and downstream temperatures, less than the allowable temperature of 0.3°C as specified in the regulation.

WAC 173-201A does not authorize a discharge plume temperature at or above 33°C for more than two seconds. In 2007, Ecology performed an independent evaluation of acute lethality and barriers to migration of salmonids using temperature data collected during the above temperature study for determination of compliance with WAC 173-201A-200(1)(c), plume temperature at or above 33°C for more than two seconds. The evaluation indicated that the 99th percentile effluent temperature discharge at the end of pipe is 30.9°C and below 33°C.

With the evaluation above and careful consideration of the effect to the river, Ecology authorizes the discharge of the treated effluent. See Response #10 for more detailed explanation.

CRK Question #10:

If DOE issues the Draft Permit, DOE will be in violation of the federal CWA and state law. Ecology's permit, which allows Georgia Pacific to violate water quality standards for temperature, violates the CWA. Each permit must contain effluent limitations to achieve WQS. 40 C.F.R § 122.44(d)(1). WQS includes narrative standards, such as protecting the designated use of salmon. The Georgia Pacific permit's additional heat load to a river that is already exceeding WQS for temperature violates the federal CWA and state law.

What effluent limitation does DOE incorporate into Georgia Pacific's permit by authorizing the Permittee "to discharge temperature based on the studies completed during the previous permit cycle"? Is this an effluent limitation? Please explain.

CRK urges DOE to revise the Draft Permit to comply with the Clean Water Act by requiring a water quality based effluent limit (WQBEL) for temperature in the Georgia Pacific permit.

Response #10:

Response #9 provides the basis for compliance of the discharge with the Water Quality Criteria, WAC 173-201A. Ecology demonstrated that the discharge meets the instantaneous lethality requirement to protect passing fish at the end of pipe. For the general lethality requirement, Georgia Pacific's discharge is below the 0.3°C incremental increased allowed by the regulation. Ecology believes that its policy allowing the incremental increase for existing discharges prior to the completion of a TMDL is consistent with the standards.

Ecology does not believe that the permit needs to include an effluent limit or that it should require ongoing temperature studies other than continued monitoring of the effluent temperature. According to the draft TMDL the additional heat load contributed by Georgia Pacific is de minimus. As noted, Ecology recognizes that the river is impaired for temperature but neither it nor EPA has completed a TMDL. EPA's draft TMDL indicated that point source discharges were not the cause of the impairment and were minimal in comparison with other sources. Ecology

does not believe that in cases such as this we should require point sources to install treatment devices before completion of the TMDL, especially since it would have an insignificant effect. In cases like this, Ecology allows existing dischargers to maintain the mixing allowance until completion of the TMDL when Ecology assigns a waste load allocation. Ecology will defer the effluent temperature limit for all affected sources at the completion of the TMDL.

CRK Question #11:

Did DOE conduct a reasonable potential analysis for turbidity? Please explain.

Response #11:

Ecology did not conduct a reasonable potential analysis for turbidity because the water quality criteria for turbidity is an in-stream criteria with an allowance over background. Turbidity does not increase in an additive manner and therefore it's difficult to predict the resultant turbidity from a mixture of effluent and receiving water. However, Ecology conducted the USEPA plume model evaluating turbidity and it indicated that Georgia Pacific's discharge met the allowance specified in WAC 173-201A-200(1)(e). See Response #12 for more details.

CRK Question #12:

Will DOE now consider whether Georgia Pacific's discharge has a reasonable potential to violate the numeric or narrative turbidity water quality standard?

Response #12:

Ecology's experience has been that effluent from secondary waste water treatment has negligible turbidity. Given the dilution available and the total suspended solids characteristics of the effluent, Ecology believes that the discharge has a minimal effect to the turbidity of the receiving water.

Georgia Pacific conducted and submitted a study on turbidity in 2007. Based on this study, Ecology determined there is a relationship between total suspended solids (TSS) and turbidity at Outfall 001. Ecology found the following:

- There is a statistically significant positive relationship between total suspended solids and turbidity.
- Total suspended solids ranged from 11 to 31 mg/L and averaged 23 mg/L. Turbidity ranged from 8 to 31 NTU and averaged 19 NTU. On most days the TSS values were greater than those of the turbidity values. Using the acute and chronic dilution ratios, Ecology predicts an average turbidity of 2.1 NTU and 0.3 NTU, respectively, at the edge of the acute and chronic mixing zones.
- The most restrictive requirements of WAC 173-201A-200(1)(e) states that turbidity shall not exceed: a) 5 NTU over background when the background is 50; b) Ten percent increase in turbidity when the background turbidity is more than 50 NTU or less. Based

on outfall dilution study update submitted to Ecology in 2004, the discharge would generate a maximum turbidity increase at the edge of the acute mixing zone during worst case (critical) conditions of 3.5 NTU, which meets the 5 NTU over the background.

- The impacts to turbidity are now further reduced due to the lower TSS loading to the river as a result of the reduction in the TSS limit in the proposed and final permit from 14,600 lbs/day to 11,085 lbs/day. The final permit also reduces effluent flow from 33.5 million gallons per day in 2004 to 23 million gallons per day in 2008. In addition, Georgia Pacific has doubled the wastewater system retention time to 14 days which allows more TSS settlement in the ASB 2 before it discharges treated effluent to the river.

CRK Question #13:

What rationale did DOE rely on to reduce monitoring of AOX in the Draft Permit?

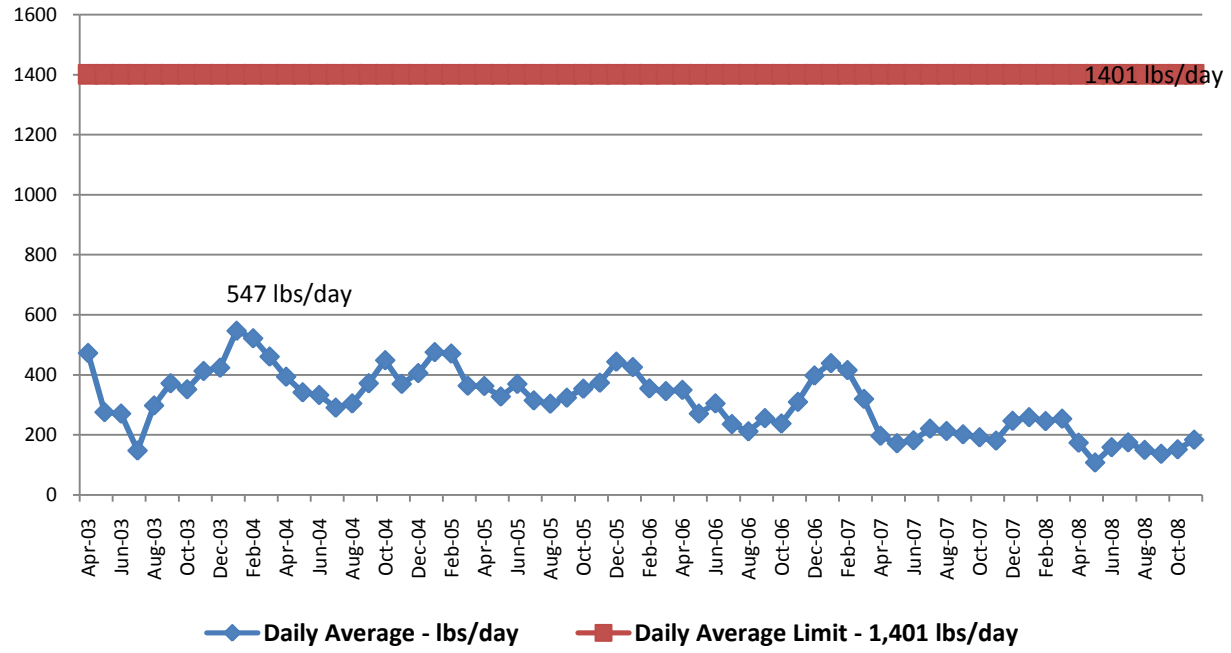
Columbia Riverkeeper is concerned about the effects of AOX compounds on the aquatic ambient environment. Notably, in 1992, British Columbia established a legally binding requirement to eliminate AOX from the pulp and paper bleaching process based on the threats these compounds pose to aquatic ecosystems. See British Columbia, Ministry of the Environment Website, http://www.env.gov.bc.ca/soe/et/06_toxic/halide.html.

Response #13:

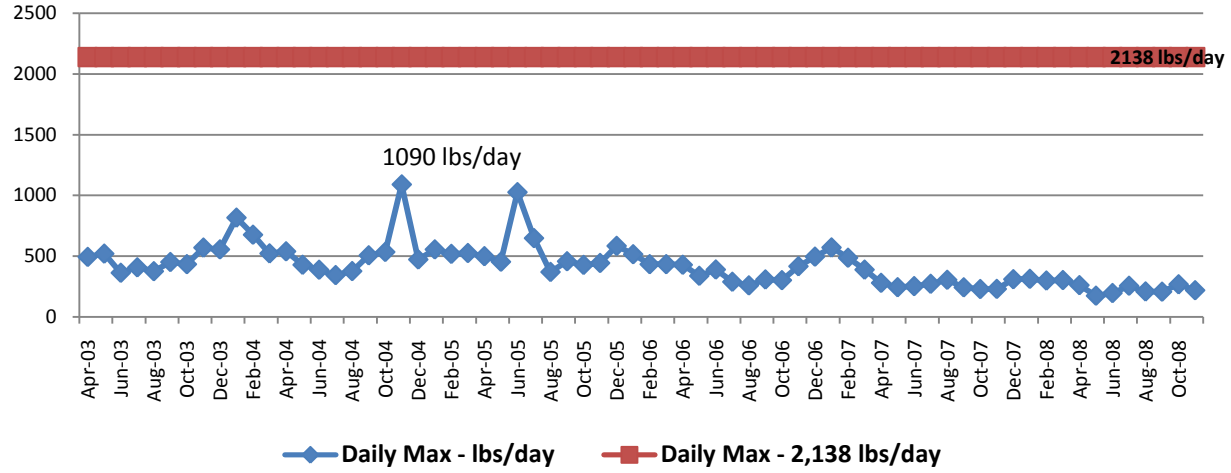
Georgia Pacific is required to monitor AOX at the final effluent on a monthly frequency. Ecology reduced this frequency from daily to monthly for the following reasons:

- EPA promulgated the Cluster Rule published in the Federal Register dated April 15, 1998 [63 FR 18572]. This rule states that after completion of the compulsory five-year monitoring the permitting authority may adjust monitoring requirements as deemed appropriate. EPA continued that it may be appropriate to allow less frequent monitoring to reduce the regulatory burden provided that the permitting authority consider the mill's compliance and enforcement history in setting monitoring frequency.
- EPA also promulgated monitoring requirements in the regulation, 40 CFR 430.02, which allows Ecology to determine the appropriate monitoring frequency for AOX, chloroform, chlorinated phenol pollutants beyond that time under 40 CFR 122.44(i) provided that the pulp uses advanced ECF bleaching processes. By definition, advanced ECF consists of the use of extended delignification.
- Since September 2000, Georgia Pacific Camas Mill utilized ECF bleaching technology with extended oxygen delignification as required by the regulations for eligibility of monitoring frequency reduction.
- The wastewater treatment system at the mill has consistently complied with all NPDES permit requirements at Outfall 001 during this permit cycle.
- For the pollutants in question, the mill's wastewater treatment system has been performed well under the permit limits by a wide margin (under 50% for the life of this permit). The following graphical presentation illustrates the performance using the actual lab data.

AOX Discharged by Georgia Pacific Camas Mill
Wastewater Treatment System
2003-2008
Daily Average Discharge



AOX Daily Maximum Discharge



Ecology retains AOX limits in the permit but at reduced loading rates from a daily average of 1,400 lbs/day to 1,141 lbs/day and a daily maximum of 2,138 lbs/day to 1,741 lbs/day.

Ecology considered and evaluated the EPA regulations and compliance data produced by the Georgia Pacific Camas Mill and determined that the proposed monitoring frequency meet the regulations and is appropriate.

CRK General Comment B:

Columbia Riverkeepers includes some general comments regarding monitoring on page 7 of the attached comment letter.

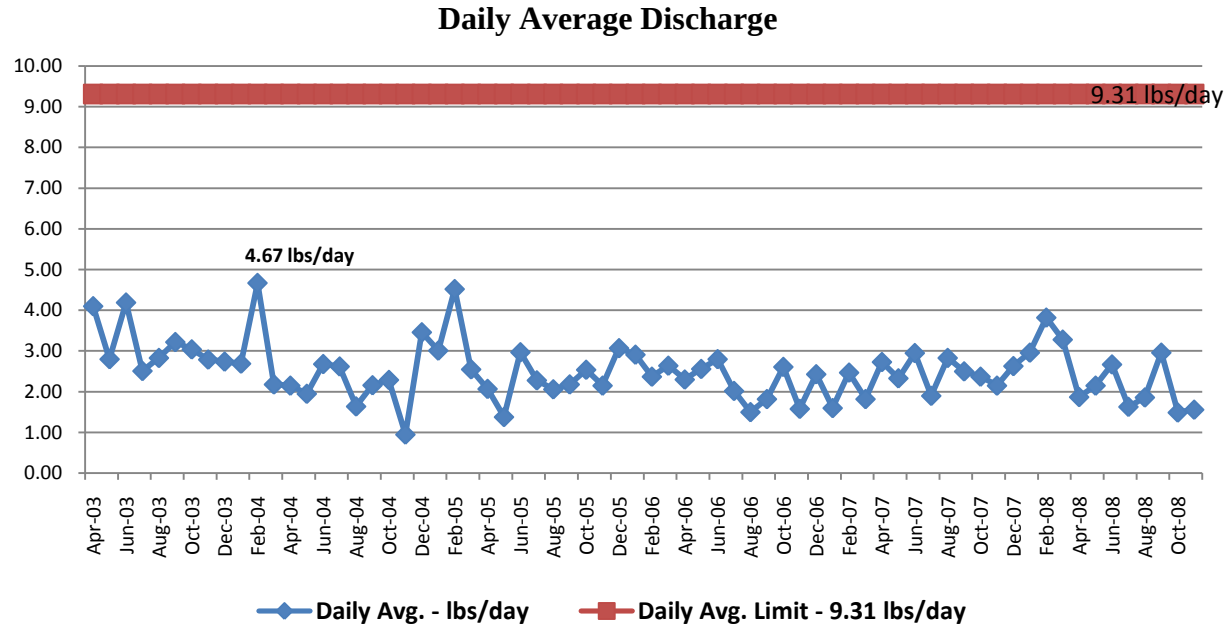
CRK Question #14:

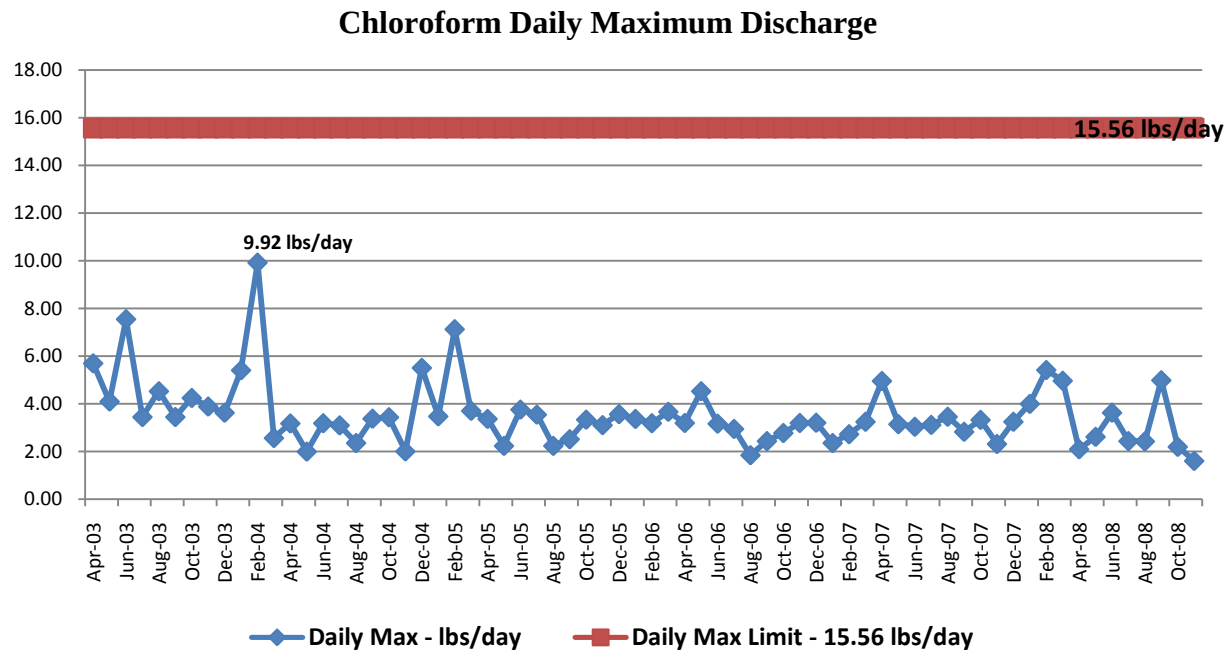
On what basis did DOE reduce chloroform monitoring from monitoring weekly to monitoring once per permit cycle? Please explain.

Response #14:

The basis for the monitoring frequency reduction of chloroform is similar to that of AOX (see Response #13). Similar to the AOX discharge, the chloroform discharged by the mill is at the level well below the permit limits. The following graphical presentation uses actual lab data to illustrate that.

Chloroform Discharged by Georgia Pacific Camas Mill
Wastewater Treatment System
2003-2008





Ecology considered and evaluated the EPA regulations and compliance data submitted by the Georgia Pacific Camas Mill. Ecology similarly determined that the proposed monitoring frequency for chloroform meets the regulations and is appropriate.

CRK Question #15:

Before DOE certifies 100% ClO2 substitution for Cl2 in the bleaching process, at what frequency must Georgia Pacific monitor chloroform? Please explain where the permit requires this frequency.

Response #15:

Before the mill employed the advanced ECF bleaching process (100% ClO_2 substitution), Ecology required that Georgia Pacific Camas Mill monitor chloroform once per permit cycle. Georgia Pacific monitored chloroform via the priority pollutant analyses as in the last permit cycles (1998-2003) and the current permit (2003-2008). Ecology specified these requirements in Condition S1.G in the permit. The final permit requires the facility to conduct a priority pollutant scan three times during the permit cycle so the facility will measure chloroform three times during the permit cycle.

CRK General Comment C:

Footnote d likewise applies to monitoring of parameters Trichlorosyringol through Pentachlorophenol. See Draft Permit at 10.1 Georgia Pacific's current NPDES permit requires monthly monitoring of Trichlorosyringol through Pentachlorophenol. See Current Georgia Pacific NPDES Permit at 13. However, the Draft Permit reduces monitoring to once per permit

cycle, subject to footnote d. As explained above, CRK recommends that DOE maintain weekly monitoring in the Draft Permit. As drafted, it is unclear what monitoring requirement Georgia Pacific must meet *prior* to 100% ClO2 substitution for Cl2 in the bleaching process.

Response C:

Ecology revised the footnote d to make clear the monitoring frequencies for chloroform and chlorinated phenolic compounds as follows:

From,
"Upon satisfactory demonstration of compliance with the chloroform standards and upon certification of 100% ClO_2 substitution for Cl_2 in the bleaching process, the monthly certification may be addressed in the monthly DMR submittal."

To,
"Upon satisfactory demonstration of compliance with the chloroform and chlorinated phenolic compound standards and upon certification of 100% ClO_2 substitution for Cl_2 in the bleaching process, the monthly certification may be addressed in the monthly DMR submittal."

CRK Question #16:

On what basis did DOE reduce monthly monitoring of parameters Trichlorosyringol through Pentachlorophenol to once per permit cycle? Please explain.

Response #16:

Based on the data that Georgia Pacific submitted to Ecology during the current permit cycle, the chlorinated phenolic compounds were not found in the bleach plant's effluent. The compounds were tested at the minimum levels as defined in the federal regulations 40 CFR 430-01(i) and were found non-detected at these minimum levels.

Ecology considered and evaluated the EPA regulations and the compliance data submitted by the Georgia Pacific Camas Mill and determined that the proposed monitoring frequency for the chlorinated phenolic compounds meets the EPA requirements and is appropriate.

CRK Question #17:

Before DOE certifies 100% ClO2 substitution for Cl2 in the bleaching process, at what frequency must Georgia Pacific monitor parameters Trichlorosyringol through Pentachlorophenol? Please state where the permit requires this frequency.

Response #17:

EPA promulgated the Cluster Rule related to water quality, 40 CFR 430 in April 15, 1998. Prior to the promulgation, EPA and Ecology did not require the facility to monitor the chlorinated phenolic compounds (Trichlorosyringol through Pentachlorophenol) in the regulations.

Therefore, the permit did not include requirements to specify the testing frequency for these compounds prior to the promulgation of this rule.

Georgia Pacific comments on the Proposed NPDES Permit WA 000298-4

Georgia Pacific Question #1:

In our review of other paper industry permit issued by Ecology (Boise Paper, Simpson Tacoma Kraft, et.) we noted that they have the following provision under Condition S4:

> D. Tank and Process Vessel Maintenance
>
> The Permittee is authorized to discharge tank and vessels residuals to the process sewers and waste treatment system for the purposes of maintaining such process equipment as long as the discharge limits for the facility in S1. A1. are not exceeded. Tank or vessel contents shall be minimized to the extent practicable prior to any such discharge to the process sewers.

Response #1:

Ecology revised the permit to include the following:

> D. Tank and Process Vessel Maintenance
>
> The Permittee is authorized to discharge tank and vessels residuals to the process sewers and waste treatment system for the purposes of maintaining such process equipment as long as the discharge limits for the facility in S1. A1. are not exceeded. Tank or vessel contents shall be minimized to the extent practicable prior to any such discharge to the process sewers.

– Ended –